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EIGHTH

BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

OF MARYLAND,

FOR THE

Two Years Ending December 31st, 1889.

ANNAPOLIS:
GEORGE T. MELVIN, State Printer.
1890.

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Maryland State Board of Health,
Secretary's Office,

January 8th, 1890.

To His Excellency the Governor,

and the General Assembly of Maryland:

I have the honor to present the Eighth Biennial Report of the transactions of the State Board of Health, in accordance with the provisions of the Acts of Assembly of 1874 and 1880, Chapters 200 and 438, respectively, which require that "the Secretary of said Board shall, at each regular session of the Legislature, submit a full report of his investigations, with such suggestions and recommendations as he may deem proper."

Respectfully,

C. W. CHANCELLOR, M. D.,
Secretary and Executive Officer.

MEMBERS OF THE BOARD.

(IN CHRONOLOGICAL ORDER.)

C. W. Chancellor, M.D	Baltimore, Md.
J. Crawford Neilson, C.E	Harford County, Md.
James A. Steuart, M.D	Baltimore, Md.
J. M. H. Bateman, M.D	Easton, Md.
Jackson Piper, M.D	Towson, Md.
John Morris, M.D	Baltimore, Md.
Hon. Wm. Pinckney Whyte	Attorney General.

OFFICERS OF THE BOARD.

Jackson Piper, M.D	*President.*
C. W. Chancellor, M.D.,	*Sec'y and Executive Officer.*

PREFACE.

The growing interest manifested in the subject of hygiene by all thoughtful observers and all enlightened advocates of social improvement is the offspring of a deeply-felt public necessity, and the principle, which is coming to be generally recognized, that the protection of the public health by the State is as truly a right of the people as the protection of persons and property against violence and fraud, is not a mere sentiment of philanthropy, but is sanctioned alike by just reasoning and sound political economy.

C. W. C.

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REPORT

OF THE

SECRETARY AND EXECUTIVE OFFICER

OF THE

State Board of Health of Maryland.

JANUARY, 1890.

PART I.

INTRODUCTION.

1. Personal Acknowledgments. In presenting this report, as the Executive Officer of the State Board of Health, I desire to acknowledge my personal obligations for the counsel and valuable assistance that has been rendered me by every member of the Board. In our mutual efforts to advance the sanitary interests of the State, our relations have been both pleasant and harmonious; and if the Legislature in its wisdom shall see fit to endow the Board with sufficient legal power to preserve the State from the ravages of disease, in accordance with the suggestions embodied in this report, there can be no doubt of both the desire and ability of the Board to carry out successfully the provisions of the law, and thus place the State in an advanced position, not only in the conservation of life and the repelling of disease, but in all those appliances

of modern sanitary science which are of benefit to the human family, from the beginning to the end of life, and which tend to increase the happiness and material prosperity of the people.

2. **Obligations to the Press.** It is with great pleasure that the attention of the Legislature is called to the obligations under which the State Board of Health has been laid by the newspaper press throughout the State. Through this powerful lever of public opinion, the Board has attained a prominence, which through any other channel would have taken years to accomplish. Whenever it has been deemed prudent to call attention to any threatened epidemic, or sanitary need, the press has generously lent its efficient aid in giving publicity to our warnings or advice. In the most courteous and generous manner, it has given a large circulation to our Quarterly Reports, which have created such an interest in sanitary matters, that the public now look for them in order to obtain the most reliable information concerning the health of the State, and the necessary precautions for avoiding disease.

3. **Correspondents of the Board.** We are indebted to a number of medical gentlemen throughout the State for valuable information contributed from month to month. To these colaborers we owe the knowledge that we possess of the various diseases that have prevailed in the State. By no other means, as the law now stands, was it possible to obtain the information concerning the sanitary conditions prevailing in different parts of the State. To these same gentlemen is likewise due the credit for whatever mortuary statistics we have been able to collect, outside of Baltimore City. When we reflect that all this useful information is contributed voluntarily, and at considerable trouble and inconvenience, without fee or reward, except the consciousness of doing good unto their fellowmen, we cannot but admire a profession that furnishes such an

instance of unselfish philanthropy, by adding, not to its own pecuniary benefit, but exactly the reverse, by aiding to improve the health of their respective communities.

4. The First Duty of the Statesman. Lord Beaconsfield has said that, "The health of the people is really the foundation upon which all their happiness and all their power as a State depend;" and the health of the people is, therefore, the first duty of the statesman. We look to the patriotism and good sense of our lawgivers to see that the proper legal means shall not be denied for the protection of the health, but that the State Board shall have ample power to add to the grandeur of this favored commonwealth, by giving it the highest measure of health, and thereby increase the wealth and happiness of the people.

5. General Sanitation and Domestic Hygiene. The study of general sanitation and domestic hygiene is receiving marked attention among the more intelligent portion of our people; indeed, a most desirable revolution is taking place upon these subjects. The work of the plumber has now been advanced into the domain of science, and it is to be hoped that the day is forever past when our lives will be threatened within our very thresholds, and around our domestic hearths by the ignorance or cupidity of unskillful workmen. The public, in these matters of domestic hygiene, is getting better and better informed daily, and the appointment of an inspector of plumbing for Baltimore, to insure the proper performance of work, places a safeguard about our homes which cannot be too highly commended. Much of this interest in sanitary appliances and the proper construction of dwellings is due to the earnest manner in which the State Board of Health has co-operated with the City Board in urging upon the State and municipal authorities the necessity for sanitary reform in these particulars.

6. Vital Statistics. Accompanying this report will be found a record of such vital statistics as could be collected under existing laws. These statistics are necessarily very incomplete and altogether unsatisfactory, and must continue to be so until there is a complete registration of all persons practicing medicine in the State, supplemented by a law requiring that all births and deaths shall be systematically reported. As it is of the utmost importance that these statistics should be complete, such legislative action ought to be had as will tend to secure this result. The benefits to be derived from a proper registration of vital statistics will be referred to further on in this report, under the head of "Suggestions and Recommendations."

7. Polluted Water and Chemical Analysis. So many applications are made to the State Board of Health for the analysis of samples of water, that I wish, in the foreground of this report, to discuss briefly the subject of water examination for sanitary purposes. The results of contamination and the means of purification will be considered further on, under their appropriate heads.

We are all interested in the water question. Thirst is more imperious than hunger, and as man must needs have water, his supply should be abundant and good. Nature does not supply chemically pure water, and such a thing must not be expected by those who seek information from the chemist's laboratory; but nature gives us an abundance of water that is at once salubrious and palatable. The pure water we want is that which is free from the deleterious matters that find their way into the sources of supply through the negligence or folly of man. It does not require a chemical analysis to determine that the water of every dug well in any town or village is unfit to drink for obvious reasons—it partakes of the soil pollution.

Many good people are disposed to think that the Board of Health is a visionary alarmist, in its continued warnings to the people to beware of the monstrous evil under their feet. Graveyard infusions, seasoned with the extract of privy vaults and pigpens, may be a luxury to those who have been accustomed to them, just as a missionary rump steak is said to be to the cannibals of the Feejee Islands, but how anybody can consent to drink water thus polluted is incomprehensible. The taste of the Cannibal is infinitely to be preferred. Few persons who have not studied the question have any idea of the mortality due to such sources. We do not wish to produce a sanitary nightmare, but it is no exaggeration to say, that in this country thousands of victims are annually poisoned to death by such waters.

The investigation of potable water presents far greater difficulties than the general public know or think. The history of the various methods proposed for the examination of drinking water, shows that these methods have changed with the theories of the causes of disease. The earlier methods were purely chemical, and a chemical analysis was all that was attempted. By it we come to a pretty accurate knowlege of the *inorganic* constituents of the water. Now this may be of importance, yet it is not as a rule vital. It is the *organic* matter that we believe to be injurious ; but organic matter undergoes so many transformations, and so rapidly, that we cannot follow them, or at least only with the greatest difficulty and very imperfectly. As a matter of fact, chemicals have not attempted to separate the organic matter which may exist in water into the various compounds which it may contain, and thus recognize and identify these separate compounds. This is an impossibility. The most that we have dared to hope for, has been to get some general hints and indications as to the nature of this organic matter.

The assumption or presumption is, that all matter of animal origin is bad, or sure to become so very quickly, while vegetable matter may become objectionable. Above all things, the excreta of the animal body, especially when diseased, are bad, always bad ; but why these excreta are so injurious is not so easily explained. Prof. Mallet, of the University of Virginia, has called attention to the fact that no known poison, in the diluted state can produce the effects which can be traced to a drinking water contaminated with human excreta.* In fact, there seems to be no dilution which can make such polluted waters safe.

It is possible that the indications obtained by the chemical examination may be in every respect satisfactory, and yet the water may be dangerous. Prof. Frankland, in a discussion of the subject of potable water† quotes the investigation of Dr. Hægler, of Bale, in which it is shown that the pure mountain water was contaminated with the secretions of a single typhoid fever patient, and as this water was the water supply of Lausen, Switzerland, an epidemic of typhoid fever broke out which was clearly traced to the water. Diluted as these secretions must have been, it is not to be supposed that any chemical examination of the water would have revealed a suspicion in regard to it. Certain it is, the water could not have been convicted upon any chemical testimony.

8. The Theory of Fermentation and Germs. Pasteur has demonstrated a theory of fermentation which has been widely extended, and is now generally accepted as the explanation of the ordinary phenomena of putrefaction and decay. This same theory, still further extended, accounts for the spread of certain zymotic diseases. The germ theory explains better than any other the communication of disease through the medium of potable water. Now, while the pure water may carry the germ of disease, it is not so likely to nourish and propagate it. On the other hand, the water which chemical tests have shown to be impure; that is to say, water which contains organic matter in excess and is prutrefying, or very liable to putrify, is

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*Report National Board Health, p. 201.
†Journal of the Chemical Society, London, 1876 ; vol. 29, p. 826.

the culture fluid for the germs of the disease. This is the explanation why waters polluted with organic filth are dangerous.

9. Biology and Bacteriology. With this presentation of the results of chemical investigation of water, it is evident that other methods, and the help of other departments of science are called for. We naturally turn to biology and its methods, in the hope that, with a history of the germ, and a knowledge of its growth and development, we may be enabled the better to recognize its presence. The last word has not yet been said in regard to the germ theory of disease, and, therefore, when samples of water are sent to be examined we are obliged to draw our conclusions very cautiously, and state them modestly.

The chemical method simply enables us to say of certain waters containing an excess of easily decomposable matter, that they are bad, or very likely to become so. The biological and bacteriological methods will no doubt give further information in regard to palatable water; but still we must confess that it will be difficult in many cases to say with certainty, this or that water is absolutely free from any injurious substance or body. The evidences we get from any known method of investigation must be considered more negative than positive. When a water is known to be polluted, as is the case with nearly all well water, this fact outweighs all the negative results of a chemical investigation. The method of Prof. Koch (germ culture), however, applied to the various methods of purifying water, shows that some of these methods are of great value, and that water teeming with germs may be practically freed from them by certain filtrations.

10. Outbreaks of Infectious Diseases. Although threatened, no epidemic has invaded any part of the State during the last two years. There have been several outbreaks of infectious diseases, of greater or less severity, but we have been happily successful in arresting their progress and spread before they reached an epidemic crisis, and have thus fully satisfied the public expectation and requirement.

Active measures have from time to time been adopted to remove the cause as well as to prevent the spread of diseases, and in this respect it is gratifying to observe that public feeling has also acquiesced. Of course a great deal remains to be accomplished, but we recognize that in sanitation, as in other things, there are ideal perfections after which, as the affairs of life are conducted, it is almost hopeless to strive, and, therefore, we have been content with such compromises as it was possible to attain, and the enforcement of such restrictions as might gradually, by experience of their good effects, induce the public to submit to more vigorous measures for the protection of health and life.

11. **Health Laws.** The wisdom of the health laws and the efficiency of the State Board of Health in executing them, have been abundantly demonstrated by the hearty endorsements received from all parts of the State. As stated in former reports, the principal work of the Board has been to educate the people as to the importance of better sanitary and hygienic conditions; to teach them how to escape sickness and death; to impress upon them the clearly ascertained fact that many diseases are preventable, and to disseminate the means of avoiding such.

12. **Need of Sanitary Legislation.** In regard to the need of sanitary legislation, the importance of the subject is such that the wisest measures should be matured and made operative by proper adjustment of existing laws and by appropriate legislation, where efficient laws do not already exist. Practical experience has demonstrated the necessity for greater executive power and authority vested in the State Board of Health. Occasions have arisen, and are likely at any time to arise, where prompt action would be all im-

portant to secure communities against the spread of pestilential disease, and for this reason the rules and regulations of the Board should have full statutory force and effect.

It has been aptly said that the health of the people is paramount to commercial prosperity, since the wheels of commerce must stop when human life is imperiled. It is also an axiom that the demands of the public good are paramount to individual interests. The practical application of restraints upon business for the protection of health is often severe in its effects upon individual interests, and nothing but the strong arm of the law can make such restraints operative. Hence the necessity of legislation for the protection of the public health.

During the last ten or fifteen years State after State has taken this matter in hand, until now, instead of three or four, thirty-two of the States have organized State Boards of Health. Maryland was one of the first States in the Union to see the urgent necessity of such a Board, and it cannot be denied that much good work has been done; but we are forced to admit that Maryland is far behind some of her sister States in failing to have upon her statute books many needed sanitary laws. As Marylanders, we are all justly proud of our State, standing, as it does, in the first rank as to intelligence and wealth of traditions; therefore, such a deficiency in our health laws, so easily remedied, should not be permitted. The State must protect her people in the enjoyment of health as well as property.

13. The Economy of Sanitation. We would be horrified if an invading army should destroy 15,000 of our citizens; and the State would, upon legitimate ground of public economy and self-preservation, appropriate "millions for defence." Now, of the 15,000 deaths occurring in this State every year, fully 5,000 are from avoidable causes—that is to say, from diseases that could be prevented by the enactment and enforcement of proper laws. For every death from avoidable disease, there are at least twelve cases of avoidable sickness,.so that, in addition to the saving of life by proper sanitation, sixty thousand cases of sickness would be prevented.

Let us see how such a result would affect the body politic. The lives of individuals represent a certain value as capital to be applied to the production of wealth. According to the best European calculations of values—the earnings and expenditures—the present worth of the excess of the former over the latter, for an unskilled laborer at twenty-five, is twelve hundred dollars ($1,200). That is, such a laborer at that age is worth so much to the body politic. This is the English and very nearly the German valuation. In this country wages are higher and earnings greater, and of course the annuity and its valuation are greater. This, too, is the estimated value of an unskilled laborer, who earns the lowest wages. The value of the skilled mechanic, the merchant, the professional man, whose earnings are larger, must be very much greater. It is, at least, safe to assume the English calculation of twelve hundred dollars as the average worth of every individual, of all conditions and occupations, and on this basis we may approximate the annual loss of the State of Maryland from preventable diseases, as follows:

Estimated number of cases of sickness from preventable diseases, annually, 60,000. Cost of ten days sickness of each, including physicians' fees, medicines, nursing, &c., at $3 per day..........	$1,800,000
Loss of time from industrial pursuits of three-fifths of the number attacked (*i. e.*, adults able to work), 36,000, at $1 per day for ten days...............	360,000
Estimated number of victims, 5,000, of which two-fifths represent a capital value of $1,200........	2,400,000
Remaining three-fifths, at an average value of $500 each	1,500,000
5,000 funerals, at an average cost of $20 each.....	100,000
Total annual loss........................	$6,160,000

These figures, made upon a basis deemed very moderate, show that the industrial interests of the State are damaged every year to the extent of over $6,000,000, and much more, if all the elements of loss, such as losses to business by interruptions, &c., could be properly ascertained, which loss would undoubtedly be greatly modified, certainly to the extent of one-half by proper sanitation.

14. **Penalties Needed to Protect Health and Life.** It is a subject worthy of the deepest consideration by our legislators whether the time has not arrived for imposing severe penalties on those who wantonly destroy the health and lives not only of their own families, but also of their neighbors, by maintaining filthy pig-pens, slaughter-houses, stables, privy vaults, &c., upon their premises; and, also, upon communities who are responsible, morally, for the presence and prevalence of infectious and contagious diseases in their midst. "There is nothing on earth," says Prof. C. A. Lindsley, "so almighty to control and direct the attention and efforts of men as the almighty dollar. Railroad corporations are compelled to pay damages in good money to their unfortunate passengers for injuries received on their roads; and for loss of life a few thousand dollars to surviving relatives. If one-half the care and vigilance exerted in making railroad and steamboat traveling safe were used in making communities safe from zymotic diseases the mortality from these diseases would be reduced to less than one-quarter its present amount."

It is I know quite idle to suggest it, but if the Legislature should see fit to take an enlightened view of the subject, and by statute make communities responsible for the suffering of their fellow-citizens from infectious diseases, then public hygiene would receive the attention which its importance demands. There is, to quote Prof. Lindsley again, better reason for paying such victims of disease than there is for paying damages to people who slip on icy sidewalks and hurt themselves. The town treasuries would suffer for a time ; but very soon sanitary works in the way of sewers, drainage schemes, aqueducts, &c., would be going forward in every town and village in the State, to save the expense of paying for so much sickness.

15. **Duty of the State in the Application of Sanitary Knowledge.** An efficient administration of sanitary laws demands both power and the expenditure of money. Without the authority of law necessary to enforce the observance of proper sanitary regulations, the State Board of Health can accomplish but little ; and without the pecuniary means necesssary to carry into operation the investigation of hygienic subjects, many important questions must fail of the proper amount of study. But as ill health and disease are more expensive than perfect sanitation, it will be found true economy for the State to make reasonable expenditures in arresting those influences and causes which are known to be injurious to the public health.

The State Board of Health should have power, under proper limitations, to compel the execution of sanitary works in towns where they are neglected, to require that proper drainage should be made and pure water supplied, &c., &c. How greatly would the health of the people of these towns be promoted and the term of life be extended, if such were the law of the State. Nothing can be more desirable than that the State should make ample provision for preserving the health and lives of her citizens.

PART II.

SANITARY INVESTIGATIONS.

16. Subjects of Special Importance to the State. In the winter of 1888 I was granted a brief leave of absence by the Board, approved by His Excellency Gov. Jackson, to visit Europe for the benefit of my health, the executive and other duties of the Secretary's office, meantime, being carefully and ably transacted by my colleagues, Dr. James A. Steuart and the President of the Board, Dr. Jackson Piper. This visit afforded an opportunity to investigate several subjects of special importance to the State, a report of which was made at the quarterly meeting of the Board in April last.

17. The Purification of Drinking Water. Chief among the subjects of investigation was the artificial purification of drinking water, a question that is now attracting much attention in Europe. Experiments have recently been made to show that noxious microbes may be removed, or at least rendered harmless, by certain methods of filtration. Guinea-pigs were inoculated with water which contained the microbe of anthrax; those inoculated with the water prior to filtration died with the usual symptoms of the disease, while those inoculated after filtration survived. It has been established that sufficiently careful filtration will remove from water many organic matters, among others strychnia; and the scientist who made this discovery was so sure of his facts that he drank, after filtration, a quantity of water in which, before it was poured into the filter, a poisonous dose of strychnia had been dissolved.

In considering the importance which should be attached to such experiments it is necessary to remember that there are different kinds of filterers and different filtering media, and that the average consumer has but scanty means of ascertaining whether those recommended to him by manufacturers are in every case such as thoroughly to fulfill scientific requirements. Filtration is undoubtedly an excellent practice, and one which, however it is accomplished, has at least the merit of rendering the water more pleasing to the eye, if not to the palate ; but it cannot be too widely known that some forms of filter do no more than this, and that water which is very bright and sparkling may yet contain noxious matters in solution.

The water of our city pumps was, in former days, famous for its sparkling limpidity as well as refreshing sweetness, and these qualities were still conspicuous when a few years ago it was declared unfit for use by competent authority. It would, therefore, be well if the sanitarian or physician, before extending his approval to the process of filtration, should lay down explicitly the conditions which a perfect filter is expected to fulfill, and the test to which it should be subjected. Without this knowledge a mere belief in the efficacy of filtering may chance, in the long run, to prove a source rather of danger than of safety to the public.

18. Filtration Through Sand. Filtration through sand which is generally used in large filters, such as in water works, has essentially only a mechanical action. It retains suspended contaminating matter similarly to ordinary strainers. Straining means storing up. If, however, organic matter be thus stored up, it must necessarily form a favorable nidus for the development of low forms of life. Here lies the danger of all purely mechanical filters, that is filters which have not the power of destroying organic filth. Any such straining action does not, moreover, extend to the separation of bacteria, for it has been proved by Dr. Tyndall* that a certain contagious poison was able to

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**Medical Times and Gazette*, June 16th, 1877, p. 647, pass unaltered through 300 layers of filter-paper. In a similar way it has been shown by Prof. Pumpelly,[*] that even filtration through 100 feet of sand entirely fails to remove the ordinary bacteria of putrefaction. As there can readily be seen under the microscope with a moderate magnifying power, and as high powers are indisputable to the detection of such bacteria as the bacillus of cholera or typhoid, the latter cannot be arrested even by the most perfect mechanical filtration through sand or other similar media. Practical experience has confirmed this, among other instances, by the manner in which the epidemic at Lausen in Switzerland spread, notwithstanding a most perfect natural mechanical filtration through sand;[†] also in a large number of cases by the spreading of zymotic diseases through shallow well water, which had passed through the surrounding sand. The same applies to other mechanical filtering media, such as charcoal.

9. Animal Charcoal. This substance has held for many years the position of being a very efficient chemical purifier of water. For a brief time its chemical action is indeed most satisfactory, but Mr. Byrne has shown[‡] that with a filter of animal charcoal weighing 4½ pounds, through which only 12 gallons of water were passed in 24 hours, the purifying effect was equal to a removal of 55½ per cent. of the organic matter from the first gallon. This gradually declined until at the fourth gallon only 1.33 per cent. was removed, and already at the eighth gallon the action was reversed, organic matter being given back to the water.

20. Animal Charcoal Favors the Growth of Bacteria. Since the progress of science has revealed the deadly action of living zymotic poisons, which occur in contaminated water, another and a much more serious danger, through the use of animal charcoal, has shown itself. The Commissioners on "River Pollution" of England, say in their VI. Report, p. 220: "The property, which animal charcoal possesses in a high degree, of favoring the growth of the low forms of organic life, is a serious drawback to its use as a filtering medium for potable water." Further on the report says: "Indeed, we found that myriads of minute worms were developed in the animal charcoal and passed out with the water, and when the charcoal was not renewed at sufficiently short intervals."

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[*] Supplement No. 13, National Board Health Bulletin, Washington, 1881.
[†] Deutche Vierteljahrsschrift fuer æffentliche Gesundheitspflege, vol. vi, p. 154
[‡] Proceedings of the Institution of Civil Engineers. London, 1867.

Similarly, it is stated in the British Army Medical Report, vol. xix, p. 170, that, "When water which has been filtered through charcoal is stored for any time it soon begins to show evidence of low forms of life, and after a time a more or less abundant sediment of organisms becomes formed. Occasionally it becomes distinctly offensive."

As far as our present knowledge goes, the employment of filtering materials containing animal charcoal must therefore be looked upon as a danger rather than a safety.

21. Purifying Action of Iron on Water. Sailors have known for many years that the foul water they must sometimes take on board, becomes sweet and even pure, if kept for a sufficient time in iron tanks. Here the rolling of the ship causes a continual renewal of contact between the iron and the water, and the latter is gradually purified. The practice of putting iron nails into impure water is also very old, and, to mention one more instance, it is a general experience that streams containing iron are purified by this agency.*

22. Magnetic Spongy Carbon. From what has been said, it is quite evident that no *organic* substance can be employed with safety as a filtering material, and, therefore, the discovery and production of a perfect mineral filtering material is a matter of great sanitary importance. The material which presents the largest surface for the occlusion of oxygen in the smallest cubical space is the most powerful purifier and filterer, provided it is composed of the proper substance. Spongy platinum fulfills these conditions best, and is consequently the most powerful purifier and filterer, and the best insoluble oxidizer known. Its enormous price, however, shuts it altogether out from practical use, and spongy iron has been used in its stead. But a better and cheaper filtering material than spongy iron has very recently been produced in England, and is now being used in that country on a large scale for both public and private filters. This substance, which is known as "magnetic spongy carbon," is manufactured from a natural rock found in Wales by a patent process. It is absolutely and entirely free from contamination with animal or vegetable matter, and contains no poisonous metals. The admixture of this substance with sand or gravel forms a filtering medium which purifies itself by deodorizing and disinfecting organic impurities, which would otherwise contaminate such beds. The process of combustion is constantly going on in the pores of the material, and the products of that combustion are tasteless, odorless, colorless and perfectly wholesome, creating carbonic acid, with which the water becomes charged to a limited extent, rendering it sparkling as well as palatable and wholesome in the highest degree. Polluted water taken from the river Thames, below London bridge, was passed through a filter composed of this material, and on being then analyzed was found to be purer than any of the drinking water supplied by the London water companies.

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* The water of George's Creek, in Allegany county, Md., is rendered very foul by receiving the sewage and refuse from several mining villages on its banks; but it is subsequently purified, in a measure, by the large amount of sulphate of iron contained in the water from the coal mines, which flows into it.

Direct Oxydation with Magnetic Spongy Carbon. This is the only natural and perfectly safe method of procedure for the purification of drinking waters, seeing that the noxious compounds found in impure waters are entirely converted into nitric and carbonic acid, which, with the bases present, forms perfectly innocuous salts. Magnetic Spongy Carbon will effect that perfect oxydation most completely. Oxygen is a poison to the most morbid form of microbes, and for that reason cannot be too freely used in all cases where sanitary purity is a desideratum.

The most powerful form of oxygen is that which is condensed or occluded upon the surfaces of the microscopic pores of magetic spongy carbon, where it is polarized or converted into ozone, and its chemical action is potent to a marvellous degree in purifying foul and polluted water.

Every engineer of experience is well aware of the disagreeable odors arising from the ordinary sand filter beds, which possess no chemical purifying action whatever, but merely act as strainers, retaining the solid matter and filth which corrupt and contaminate the water instead of purifying it, besides which the mud and slime give off a very offensive odor akin to that of putrefying fæcal matter. This may be remedied by a layer of Magnetic Spongy Carbon.

Not only may fevers be averted and lives saved by drinking water which has been purified by passing through Magnetic Spongy Carbon, but an enormous saving will be effected in the construction of filter beds in which Magnetic Spongy Carbon is used, inasmuch as smaller excavations, smaller embankments, less masonry, less sand and less gravel are required, and more storage capacity is obtained; these advantages are gained by the fact that, with the use of Magnetic Spongy Carbon, the filtering and purifying depth need never exceed 3 feet, whereas in sand filter beds frequently as much as from 7 to 10 feet of sand, shells, gravel and shingle is used, and a great head of water is necessary to strain the water through this large body of material. It is thus self-evident that by adopting the Magnetic Spongy Carbon system at existing water works, a much greater storage capacity can be secured, and by adopting the Magnetic Spongy Carbon system of purification at new water works many thousand dollars can be saved, the amount, of course, depending upon the number and area of the filter beds.

23. Pollution of Water Courses. The question of the pollution of Water Courses, which is nearly akin to that of the purification of the water obtained from them, like the latter, is attracting much attention among sanitarians in Europe. It has been universally decided that water courses ought not to be polluted, and that all refuse likely to pollute them should be passed through the soil by irrigation; but no definite plan has been set forth whereby that which is so plainly desirable can be rendered possible. Many manufacturing industries yield large quantities of refuse liquid which is injurious to fish or animals by reason of matters either dissolved or held in suspension, but it would plainly be impossible either to require every manufacturer to be an agriculturist, and to hold land upon which his waste liquids might be poured out, or to require every farmer to place upon his land whatever the neighboring manufacturer might choose to send him.

As a matter of fact, the suspended matters soon fall to the bed of the stream, and the dissolved matters are more or less oxidized, so that the operation of any law to prevent the pollution of streams should be limited, as in England, to flagrant cases, or to preventing the discharge of refuse into rivers in situations where a definite mischief would be wrought before any natural process of purification could be completed. No doubt the tendency of the times is to carry restrictions further than they have been carried heretofore, partly because the dwellers by the banks of rivers are becoming more and more conscious of the charms of a pure and limpid stream, partly because the manufacturer, when prevented from discharging his waste in the accustomed way, has more than once found means of turning it to highly profitable account, and has, in the long run, been the chief gainer by a prohibition which at first he regarded as a hardship.

And so, while the dogmatism not uncommon among sanitarians is apt to call forth a smile from "practical" legislators, and unregenerate people, it is perhaps well to regard with some indulgence the time and the money which sanitarians donate to acquiring a thorough knowledge of sanitary science. Sanitarians are certainly harmless; they may be useful. They at least serve to direct attention to subjects which the mass of mankind, in the turmoil of work and play, are too apt to overlook; and by dint of investigations, either at home or abroad, they prepare the way for a more extended knowledge of truth, and for better perception of the extent to which the liberty of the individual must sometimes be restrained, in order that it may inflict no injury upon his neighbor.

24. Prevention of Consumption. Of all diseases pulmonary phthisis claims, both in city and country, the largest number of victims. In 1884, a year chosen at hazard, for example, there were 56,970 deaths in Paris, and of these about 15,500—over a quarter—died of tuberculosis. In England phthisis is shown, by the annual returns of the Registrar-General, to be one of the most frequent causes of death in that country, more especially during the working period of life, viz., between the ages of 15 and 65 years. If, then, it can be shown to depend upon conditions which are under human control, it is obviously to the interest of the community that a systematic attempt should be made to diminish, and where possible remove, the preventable causes of this disease. In the present paper facts are brought together which prove the influence on the prevalence of phthisis of conditions which come within the scope of preventive medicine, and tend to show that much of the mortality from this disease might be prevented by due attention to hygiene and sanitation.

Experiments have abundantly proved that tubercular disease can be communicated from affected animals to the healthy; the communicability of consumption has long been a matter of popular belief, and cases are referred to which seem to prove this point. The dependence of tuberculosis upon the infective bacillus has also been shown by numerous experiments.

Phthisis, then, depends primarily upon the reception into the body of an infective particle or micro-organism—the bacillus tuberculosis—and is thus in close relation with the infectious diseases, towards the control of which preventive medicine has already done so much.

Amongst the various modes by which the infecting bacillus has been shown to enter the body, there are two which are of special importance in connection with the subject of this paper.

Communication by means of the mucous membrane of the alimentary canal is of interest, because of the tuberculosis in cattle, and from the experimental proof of the infectiveness of the milk of tuberculous cows. As animals which are crowded together in sheds with deficient ventilation are most liable to tuberculosis, an efficient inspection of cattle kept for dairy purposes is necessary. Although the injurious properties of the milk of diseased animals may be destroyed by boiling, precaution is required as to the selling of milk for food, and even though the bacilli are rarely found in the muscles, it has been suggested that tuberculosis should be included amongst the contagious diseases of animals in the present Act. Infection through the respiratory system is, however, the most frequent starting point of phthisis, and as the risk is intensified by close contact, and by the crowding together of sick and healthy, the necessity for ventilation is apparent, and becomes more so when predisposing causes are considered.

Wherever tuberculous persons or animals are congregated, the air must contain large numbers of the tubercle bacilli, which must be taken with the inspired air by many individuals, of whom only a proportion become phthisical. It is possible that, even if the bacilli escape expulsion during the expirator act, the healthy tissues do not afford them a suitable habitat; but a lowered vitality of the tissues, whether local or general, places them in a more favorable condition for the development of the micro-organism, and thus constitutes in the individual a *predisposition* to tubercular disease. Speaking generally, a susceptibility to tubercle may be produced by diseases of the respiratory system, or by constitutional enfeeblement.

Amongst the predisposing causes, some of the most important result from the aggregation of persons in a crowded population, or from the industries which mark an advancing civilization. Indoor and sedentary occupation, as well as those in which much dust is inhaled, influence largely the prevalence of phthisis ; and much of this disease amongst those who follow these occupations is preventable. Here again the basis of all preventive measures is to be found in the efficient ventilation of mines and workplaces. Printers, tailors and dressmakers afford sufficient example of the injurious effects of employment in crowded and ill-ventilated rooms ; and the prevalence of phthisis amongst these classes is shown to be very considerable. The home-workers are more difficult to deal with than those working in large establishments ; but the provision of public workrooms in which conveniences for the various occupations could be found, might lessen the evils of the present state of things.

With regard to climate, its influence in the causation of phthisis is probably infinitesimal as compared with the effect of density of population. The dampness of the soil has been shown to have some influence on the prevalence of the disease, and this can be remedied by drainage. Dampness in houses may be prevented by concrete foundations and the insertion of a damp-proof course in the brickwork above the level of the ground.

Overcrowding is of two kinds : the aggregation of buildings on a confined area, with insufficient open space around and between houses ; and the crowding together of the inmates within the houses. Both are unfortunately too common, and are potent factors in the development and spread of tubercular disease. By-laws should be enforced regulating the width of streets, the amount of open space around houses, the minimum height of rooms and size of windows, and efficient inspection of new houses should be carried out before they are allowed to be occupied. Tenement houses should be licensed to hold a certain number of inmates, and be liable to inspection. In considering the number of inmates to be allowed to a house, attention should be paid to the means of ventilation, as well as to the number and size of the rooms.

As many diseases which produce a general debility thereby predispose to tuberculosis, sanitary and hygienic measures directed against these tend to diminish the amount of phthisis in a community, and seeing that insufficiency of food, or fresh air, and of exercise, continued anxiety and mental depression, and dissipation, must be reckoned amongst the predisposing causes, the philanthropist may assist the sanitarian in the fight against this wide-spread disease. The fundamental principles which must form the basis of any successful attempts to diminish the prevalence of phthisis are (1) to provide a sufficiency of fresh air in and around dwellings and work-places; and (2) to endeavor to improve the resisting powers of the individual by hygiene and physical training during the period of growth and development, and by exercise and recreation alternating with the work of maturer age. As the effects of phthisis in the individual are not confined to a single generation, but are handed down by hereditary transmission from parent to child, any causes which tend to increase tubercular disease amongst the adult members of a population must be regarded as tending to produce a progressive deterioration of race. We owe it, therefore, to succeeding generations, as well as to those of our own day, to allow no time to be lost in commencing a systematic attack against the preventable causes of phthisis.*

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*Paper read by J. Edward Squire, M.D., before the Epidemological Society, London, January 9, 1889.

25. Report of the Paris Commission on Tuberculosis. In a report of the Commission appointed to investigate tuberculosis, read before the Academy of Medicine of Paris, the following rules were suggested in order to insure security from the transmission of tuberculosis:

1. Be known that the sputa of phthisical subjects is the most formidable agent of transmission of tuberculosis; there is danger to the public in discharging the sputa upon the earth, carpets, hangings, curtains, napkins, handkerchiefs, clothes and coverings.

2. Be well understood that the use of spittoons should be imposed everywhere and by every one. These spittoons should be daily emptied into the fire and well washed with boiling water. They should never be emptied upon dust heaps or in the garden, where they might lead to the infection of the poultry, or in latrines.

3. Never sleep in the bed of a tuberculous subject; to occupy his room as little as possible; but, above all, do not allow young children to sleep there.

4. Remove from places or dwellings inhabited by tuberculosis subjects all persons who may be considered as predisposed to the disease; the children born of tuberculous parents, those having had measles, small-pox, pneumonia, repeated attacks of bronchitis, or suffering from diabetes, etc.

5. Not to use articles which possibly may have been contaminated by phthisical patients (linen, bedding, clothing, articles of toilet, hangings, furniture, toys) except after thorough disinfection (high-pressure steam, boiling, sulphur vapors, or lime-washing).

6. Insure that the rooms of hotels, furnished apartments, cottages, or villas occupied by phthisical patients in watering places or winter resorts, are furnished and carpeted in such a manner as to render them capable of undergoing easy and thorough disinfection after the departure of each patient. It would be better if such rooms had neither curtains, carpets,

nor hangings; but were washed with lime and the floor covered with linoleum. It is of the highest importance to the public that they should prefer the hotels in which such indispensable hygienic precautions and measures for disinfection are thoroughly carried out.

26. Report of the New York Commission on the Prevention of Tuberculosis. A few months ago the Health Department of New York appointed a commission of eminent physicians, consisting of Drs. Biggs, Prudden and Loomis, to thoroughly investigate the subject and report as to the best means of preventing tuberculosis or consumption. The question is of such vital importance because of the wide-spread desolation produced by this disease, that we believe we cannot do better than present their report in full, together with certain rules respecting preventive measures adopted by the Health Department, in accordance with the suggestions made by the commission respecting preventive measures. Unfortunately, as has been remarked, several of the rules are seemingly impracticable in the present state of society; and yet the observance of any of them will to that extent lessen the damages. The faithful observance of all would infinitely lessen the number of cases.

REPORT.

The disease known as tuberculosis and, when affecting the lungs, as pulmonary tuberculosis (consumption), is very common in the human being and in certain of the domestic animals, especially cattle. About one-fourth of all the deaths occurring in the human being during adult life is caused by it, and nearly one-half of the entire population at some time in life acquires it. The disease is the same in nature, in animals and in man, and has the same cause.

It has been proven beyond a doubt that a living germ, called the tubercle bacillus, is the cause and the only cause of tuberculosis. It does not seem necessary to state the facts upon which this assertion is based, for the observation first made by Robert Koch in 1882 has been confirmed so often and so completely that it now constitutes one of the most absolutely demonstrated facts in medicine.

Tuberculosis may effect any organ of the body, but most frequently first involves the lungs. When the living germs find their way into the body they multiply there, if favorable conditions for their growth exists, and produce small new growths or nodules (tubercles) which tend to soften. The discharges from these softened tubercles, containing the living germs, are thrown off from the body. In pulmonary tuberculosis these discharges constitute, in part, the expectoration. The germs thus thrown off do not grow outside the living human or animal body, except under artificial conditions, although they may retain their vitality and virulence for long periods of time, even when thoroughly dried. As tuberculosis can only result from the action of these germs, it follows from what has just been said that when the disease is acquired it must result from receiving into the body the living germs that have come from some other human being or animal affected with the disease.

It has been abundantly established that the disease may be transmitted by meat or milk from tubercular animals. The milk glands in milch cows often become affected with the disease when their lungs are involved, and the milk from such animals may contain the living germs and is capable of producing the disease. Among stall fed dairy cows twenty per cent. or thirty per cent. are sometimes found to be affected with the disease. Tubercular animals are also frequently killed for food; their flesh sometimes contains the germs, and if not thoroughly cooked is capable of transmitting the disease. Boiling the milk or thoroughly cooking the meat destroys the germs. Although the meat and milk from tubercular animals constitute actual and important sources of danger, the disease is acquired, as a rule, through its communication from man to man.

Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which the living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption, contains these germs, often in enormous numbers. This material, when expectorated frequently, lodges in places where it afterward dries, as on the streets, floors, carpets, clothing, handkerchiefs, etc. After drying, in one way or another, it is very apt to become pulverized and float in the air as dust.

It has been shown experimentally that dust collected from the most varied points, in hospital wards, asylums, prisons, private houses, etc., where consumptive patients are present or have been present, is capable of producing tuberculosis in animals when used for their inoculation. Such dust may retain for weeks its power of producing disease. On the other hand, dust collected from rooms in institutions or houses that have not been occupied by tubercular patients does not produce the disease when used for the inoculation of animals.

These observations show that where there are cases of pulmonary tuberculosis, under ordinary conditions, the dust surrounding them often contains the tubercle bacilli; and persons inhaling the air in which the dust is suspended may be taking in the living germs. It should, however, be distinctly understood that the health of tubercular patients and the moist sputum, received in proper cups, are not elements of danger, but only the dried and pulverized sputum. The breath and moist sputum are free from danger, because the germs are not dislodged from moist surfaces by currents of air. If all discharges were destroyed at the time of exit from the body, the greatest danger of communication from man to man would be removed.

It then follows, from what has been said, that tuberculosis is a distinctly preventable disease.

It is a well-known fact that some persons, and especially the members of certain families, are particularly liable to tuberculosis and this liability can be transmitted from parents to children. So marked and so frequent is this liability, and so frequent is the development of the disease in particular families that the affection has long been considered hereditary. We now know that tuberculosis can only be caused by the entrance of the germ into the body ; and that this transmitted liability simply renders the individual a more easy prey to the living germs, when once they have gained entrance. The frequent occurrence of several cases of pulmonary tuberculosis in a family is then to be explained, not on the supposition that the disease itself has been inherited, but that it has been produced after birth by transmission directly from some affected individual. Where the parents are affected from tuberculosis the children from the earliest moments of life are exposed to the disease under the most favorable condition for its transmission, for not only is the dust of the house likely to contain the bacilli, but the relationship also between parents and children, especially between the mother and the child, are of that close and intimate nature especially favorable for the transmission by direct contact.

If, then tuberculosis is not inherited, the question of prevention resolves itself principally into the avoidance of tubercular meat and milk, and the destruction of the discharges, especially the sputum, of tubercular individuals.

As to the first means of communication, those measures of prevention alone answer the requirements, which embrace the governmental inspection of dairy cows and of animals slaughtered for food, and the rigid exclusion and destruction of all those found to be tubercular.

For the removal of the second means of communication, i. e., the sputum of tubercular individuals, the problem is simple when the patients are confined to their rooms or houses; then wooden or paste-board cups with covers should always be at hand for the reception of the sputum. These cups are supported in simple racks, and at least once daily or more frequently if necessary, should be removed from the racks and thrown with their contents into the fire.

The disposition of the expectoration of persons who are not confined to their rooms or houses is a far more difficult problem. The expectoration certainly should not be discharged on the street, and the only practicable means for its collection seems to be in handkerchiefs, which when soiled should at the earliest moment be soaked in a solution of five per cent. of carbolic acid and then boiled and washed. Handkerchiefs thus soiled are exceedingly dangerous factors in distributing tubercle bacilli; for when the sputum becomes dry it is easily separated in flakes from the cloth, and then becomes pulverized and suspended as dust.

It becomes evident from what has been said, that the means which most certainly prevent the spread of this disease from one individual to another, are those of scrupulous cleanliness regarding the sputum. These means lie largely within the power of the affected individual. It is furthermore to be remembered that consumption is not always, as was formerly supposed, a fatal disease, but that it is in very many cases a distinctly curable affection.

An individual who is well on the road to recovery may, if he does not with the greatest care destroy his sputum, diminish greatly his chances of recovery by self-inoculation.

While the greatest danger of the spread of the disease from the sick to the well is in private houses and in hospitals, yet if this danger is thoroughly appreciated, it is for the most part quite under control, through the immediate destruction of the sputum and the enforcement of habits of cleanliness. But in places of public assembly, such as churches and theatres, particularly the latter, the conditions are different, and the safety would seem to depend largely upon a dilution and partial removal of the floating and possible dangerous dust by means of adequate ventilation.

Rooms in private houses and hospital wards that are occupied by phthisical patients should from time to time be thoroughly cleaned and disinfected, and this should always be done after they are vacated before they are again occupied by other individuals.

Steamship companies should be obliged to furnish separate apartments for consumptive persons so that no person in the exigencies of travel need be forced to share his room with one who might be a source of active danger to him.

We desire to especially emphasize the following facts:

1. That tuberculosis is a distinctly preventable disease.
2. That it is not directly inherited; and
3. That it is acquired by the direct transmission of the tubercle bacillus from the sick to the healthy, usually by means of the dried and pulverized sputum floating as dust in the air.

The measures then, which are suggested for the prevention of the spread of tuberculosis are:

1. The security of the public against tubercular meat and milk, attained by a system of rigid official inspection of cattle.
2. The dissemination among the people of the knowledge that every tubercular person may be a source of actual danger to his associates, if the discharges from the lungs are not immediately destroyed or rendered harmless; and
3. The careful disinfection of rooms and hospital wards that are occupied or have been occupied by phthisical patients.

RULES.

1. Do not permit persons having consumption to spit on the floor or on cloths unless the latter be immediately burned. The expectoration of persons suspected to have consumption should be caught in earthen or

glass dishes containing the following solution: Corrosive sublimate, one grain; water, one pint, and finally thrown into the sewer or burned.

2. Do not sleep in a room occupied by a person who has consumption. The living room of a consumptive patient should have as little furniture as practicable. Hangings should be especially avoided. The use of carpets and rugs ought always to be avoided.

3. Do not fail to wash thoroughly the eating utensils of a person who has consumption as soon after eating as possible, using boiling water for the purpose.

4. Do not mingle the unwashed clothing of a consumptive person with similar clothing of other persons. The soiled clothing of a consumptive person should be removed at once, put in boiling water for forty-five minutes, or otherwise disinfected.

5. Do not fail to catch the bowel discharges of a consumptive person with diarrhœa in a vessel containing corrosive sublimate, one grain; water, one pint.

6. Do not fail to consult the family physician regarding the social relations of persons suffering from suspected consumption.

7. Do not permit mothers suspected of having consumption to nurse their offspring,

8. Household pets (animals or birds) are quite susceptible to tuberculosis, therefore do not expose them to persons afflicted with consumption; also do not keep but destroy at once all household pets suspected of having consumption, otherwise they may give it to human beings.

9. Do not fail to cleanse thoroughly the floors, walls and ceiling of the living and sleeping rooms of persons suffering from consumption at least once in two weeks.

27. Imperfect and Dangerous Beer. Investigations are now being conducted to ascertain as far as may be, the effect upon the public health of drinking imperfect beer. If possible, the result of this investigation will be laid before the present Legislature in a supplementary report, in order that carefully devised

measures may be adjusted to protect the public against the great evil of the manufacture and sale of unwholesome beer—a kind of medicated malt poison—which, it is believed, has greatly augmented the number of deaths from certain fatal diseases, as apoplexy, palsy, Bright's disease of the kidneys, etc.

Beer, it is said, ought to have six properties. It should be: 1, Made of good materials; 2, properly fermented; 3, of an adequate strength; 4, old, and free from dregs; 5, clear and thin; and 6, of a pleasant taste. How far most of the beer manufactured in this country falls short of these requisites we hope to be able to demonstrate in the course of the inquiries which have been inaugurated; but enough has been ascertained already to make it quite certain that nine-tenths of common beer drank in this country is "medicated;" and when strongly impregnated with bitters and narcotics, *et id omne genus*, it is apt to induce drowsiness, and consequently should not be drunk, especially where there is a tendency to affections of the head. Under no circumstances should it be drunk until it has gone through a process, so to speak, of refining, as it contains more viscid particles than other beverages, all of which should be fully disposed of before it is used.

Galen and Dioscorides, two celebrated ancient physicians, condemned malt liquors as unwholesome, especially in affections of the stomach, bowels, liver and kidneys.* It is objected to malt liquors by modern physicians, that it has a tendency to produce unwieldy corpulency; and, it cannot be denied, that when taken in considerable quantities, without sufficient exercise, it has this effect. It is also stated that those who indulge to excess in common beer are liable to have the mind injured, as shown by the statistics of the insane asylums of Germany.

Beer seldom agrees with the sedentary or bilious, and is highly improper for the corpulent, gouty, rheumatic or asthmatic ; or for those who are liable to giddiness and head complaints, or for those who have any tendency to venal, hepatic or pulmonary affections. Lastly, it is objected to beer, that it is much more injurious to the health to be intoxicated with it than with wine or even whiskey. This latter objection, however, is more leveled at the abuse than the proper use of the article.

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*Galen, lib. vi. Dioscorides, lib. ii., chap. 80 and 82.

It has been said that the average American beer drinker has so little regard for the well-being of his liver and kidneys that he never raises the question of the composition of his favorite beverage. Trade is clamorous for profit, and customers are uncritical. An eminent chemist, who has devoted some time and study to the subject, is reported as saying: "Brewers are using materials other than malted barley, such as corn and oats, etc., mixed with barley and hops, by which they accelerate its manufacture, making a sweetish, pleasing, heady beverage, but alcoholic, and using this kind of beer in large quantities daily, with the idea that it is innocuous, has brought on a marked increase of venal complaints." If this could be shown, the manufacturers of such "stuff" should be liable to prosecution.

The term "lager beer" implies a beer that has been kept a certain period. In Austria and Germany the laws impose heavy penalties for neglecting this ageing process, without which it is then adjudged that the product is detrimental to health.

Here, in the absence of special legal compulsion, and in the presence of a large and pressing demand, the temptation is correspondingly great to fill the want, not only speedily but profitably. Neither State nor local health officers can do this subject justice with the meagre amount of time and means allotted them. To ferret out the "crookedness" of dishonest and unscrupulous manufacturers, to make the exhaustive qualitative and quantitative analyses necessary to convict the guilty, and vindicate the innocent and honorable, would require considerable more means than is allotted the State Board of Health. Despite this condition, however, the question is none the less important, and is one to which I shall diligently devote my attention. That we have good lager beer is not denied; that we have imperfect and dangerous beer is, no doubt, equally true.

In discussing the nutritive and other qualities of beer the *Scientific American* thus speaks out:

"For some years a decided inclination has been apparent all over the country to give up the use of whiskey and other strong alcohols, using as a substitute beer and other compounds. This is evidently founded on the idea that beer is not harmful, and contains a large amount of nutriment; also that bitters may have some medical quality which will neutralize the alcohol which it conceals, etc. These theories are without confirmation in the observation of physicians. The use of beer is found to produce a species of degeneration of all the organs. Profound and deceptive fatty deposits, diminished circulation, conditions of congestion and preservation of functional activities, local inflammations of both liver and kidneys are constantly present. Intellectually, a kind of stupor, amounting in some cases almost to paralysis, arrests the reason, changing all the higher faculties frequently into a mere animalism, sensual, selfish, sluggish, varied only with occasional paroxysms of anger that are senseless and brutal. In appearance, the beer-drinker may be the picture of health; but in reality he is most incapable of resisting disease. A slight injury, a severe cold, or a shock to the body or mind, will more commonly provoke acute disease, ending fatally. Compared with inebriates who use different kind of alcohol, he is more incurable, and more generally diseased. The constant use of beer every day gives the system no recuperation, though gently stimulant at the time, but steadily lowers the vital forces. It is our observation that beer-drinking in this country produces the very lowest kind of inebriety, closely allied to criminal insanity. The most dangerous class of ruffians in our large cities are beer-drinkers. Recourse to beer as a substitute for other forms of alcohol merely increases the danger and fatality."

28. How Smoking Affects Boys. An English physician has been investigating the effect of smoking on boys. He took for his purpose thirty-eight boys, aged from nine to fifteen, and carefully examined them. In twenty-seven he discovered injurious traces of the habit. In twenty-two there were various disorders of the circulation and digestion, palpitation of the heart, and more or less taste for strong drink. In twelve were frequently bleedings of the nose, ten had disturbed sleep, and twelve had slight ulceration of the mucous membrane of the mouth, which disappeared on ceasing to use tobacco for several days. The doctor treated them all for weakness, but with little effect until the smoking was discontinued, when health and strength were soon restored.

PART III.

SUGGESTIONS AND RECOMMENDATIONS.

The following subjects are all more or less directly connected with public health, and should be fully discussed before the committees to whom they may be referred by the Legislature. Experience has shown that some additional laws, and some changes in existing laws are necessary in order to secure more complete results in the sanitary administration of the State.

29. Notification of Infectious Diseases. We have no law requiring the compulsory notification of infectious or contagious diseases. A case of such disease occurs and no notification is sent to the Health Department; no one takes the case in hand, and the first thing known is the outbreak of an alarming epidemic. The State Board of Health has no means of discovering the single case from which the contagion springs, yet the Board would, no doubt, be condemned for indifference or carelessness should such a disease become epidemic. If the medical attendant be not compelled to make notification of contagious diseases, how are the health officials to get the advice on which to take the necessary steps for the prevention of an epidemic? The law does not compel the attending physician to report the case, and the State Board of Health may be ignorant of its existence until the disease has become epidemic. A law compelling the attendant to report all such cases promptly would be the means of preventing the spread of the disease, and would save much suffering in many homes that should be free from sickness.

When we come to the question of the manner in which or the person by whom this notification shall be made, we at once encounter difference of opinion, but this difference is generally confined to members of the medical profession, and almost without exception to those who do not care to aid public health work.

One thing is certain if notification is to be made, the public at large care but little what is the exact *modus operandi* by which this is to be carried out, whether directly by the medical attendant or indirectly by him, through those having the care of the patient. In the very large proportion of cases the knowledge that a patient is suffering from an infectious disease comes from, or is confirmed by the medical attendant; why, therefore, complicate the machinery by the introduction of another person, through whose hands the notice must go; persons, too, of whom the greater number are among the poor or working classes—often illiterate and but little used to postal communication, and harassed and worried at the time by the sickness in the house, all of which tends to the delay and even miscarriage of the information, at a time when it is often of the greatest importance that no delay should occur, if effectual means are to be taken by the sanitary authority to arrest the spread of the disease.

If a health authority is to take any effectual measures to prevent the spread of infection, it is of the first importance that it should know, and know promptly, of the exact locality of each case as it arises. The whole question is on an exact par with the means taken to prevent and arrest fires. What the first few minutes are in the case of a fire, so the first cases of such diseases as small-pox, diphtheria, typhoid and scarlet fever are in relation to epidemics in the ease with which they may be stayed and arrested in their spread, compared with the difficulty experienced when once they have made any considerable headway.

In conclusion I would summarize as follows:

(*a*) That the good results arising from prompt notification of disease are palpable and self-evident. That by its means a vast amount of sanitary inspection is brought about, and dangerous defects and nuisances remedied and abated. That the attendance of children at our elementary schools is effectually controlled where it is necessary to prevent disease spreading. That effective supervision is maintained over callings, trades and occupations by means of which disease might be spread to the community at large.

(*b*) That effective disinfection can in every case be carried out, in place of the shams which too often do duty for it.

(*c*) That effective and prompt isolation of patients can be secured in cases of the more dangerous diseases.

(*d*) And, lastly, that all this will tend to educate the masses of the people, and bring home to them in an unmistakable manner some of the first principles of hygiene ond health.

30. Isolation and Disinfection. "That kindness," says a writer in the *Sanitary News*, "which permits unrestricted visits to the bedside of contagion springs from a mistaken idea of affectionate regard, and is repaying the misconceived offices of love with disease and death. The apparent harshness of the law in this regard is but the tenderest mercy, and its most rigid enforcement is the greatest blessing that can be conferred."

It has been established by trustworthy statistics that the number of cases as well as the mortality from contagious or infectious diseases can be very largely reduced by the isolation of the sick, and other needful precautions. In the city of Baltimore, the energetic Health Commissioner, Dr. James A. Steuart, requires isolation of the sick and absence from the schools of pupils who would possibly be distributers of disease, and if like precautions were exercised by the county authorities we should find that the whole State would soon show a greatly diminished death rate from such diseases.

In this connection it will not be amiss to direct attention to the Law of 1882, chapter 155, entitled "An

Act to provide against the spread of infectious diseases." This law, which is very comprehensive, provides:

(1). "That when the health authority of any city or town, or any justice of the peace for any county, is of opinion, on the certificate of a qualified medical practitioner, that the cleansing and disinfecting of any house or part thereof, and of articles therein likely to retain infection, would tend to prevent or check infectious diseases, it shall be the duty of such authority or justice of the peace to give notice in writing to the owner or occupier of such house or part thereof, requiring him or her to cleanse and disinfect such house, or part thereof, and articles, within a time specified in such notice; and if the person to whom notice is so given fails to comply therewith, he or she shall be liable to a penalty of not less than five dollars and not exceeding ten dollars for every day during which he or she continues to make default; and the health authority or justice of the peace, as the case may be, shall cause such house or part thereof, and articles, to be cleansed and disinfected, and may recover the expenses incurred from the owner or occupier in default, as other fines and forfeitures are recoverable; provided, that where the owner or occupier of any such house or part thereof is from poverty or otherwise unable, in the opinion of the authority or justice of the peace, effectually to carry out the requirements of this section, such authority or justice of the peace may, without enforcing such requirements on such owner or occupier, clean and disinfect such house or parts thereof, and articles, and the city, town or county in which such house is situated, shall defray the expenses thereof.

(2). "That any health authority in any city or town, or any justice of the peace for the county, may direct the disinfection or destruction of any bedding, clothing or other articles which have been exposed to infection from any dangerous infectious disorder; provided, that when any person sustains any damage by reason of the exercise of any of the powers of this act, in relation to any matter as to which he is not himself in default, reasonable compensation shall be made by the municipal or county authorities to such person."

(3). "That where any suitable hospital or place for the reception of the sick is provided, within a convenient distance, any person who is suffering from any dangerous infectious disease, and is without proper lodging or accommodation, or lodged in a room occupied by more than one family, or is on board of any ship or vessel, may, on a certificate signed by a qualified medical practitioner, and with the consent of the superintending body of such hospital or place, be removed by order of any health authority or justice of the peace to such hospital or place, at the cost of the city or county in which such case may occur; and any person who wilfully disobeys or obstructs the execution of such order shall be deemed guilty of a misdemeanor, and shall be fined not less than fifty dollars or more than two hundred dollars, or be imprisoned in jail, in the discretion of a competent court, not less than one month or more than six months.

(4). "That any person who, while suffering from any dangerous infectious disorder, wilfully exposes himself or herself, without proper precautions against spreading the said disorder in any street, public place, shop, inn or public conveyance or enters any public conveyance without previously notifying the owner, conductor or driver thereof that he is so suffering, or being in charge of any person so suffering, so exposes such sufferer, or gives, lends, sells, transmits or exposes, without previous thorough disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any such disorder, shall be liable to a penalty not exceeding five hundred dollars, or imprisonment not exceeding twelve months, or both, in the discretion of a competent court.

(5). "That any person, parent or guardian or other party, who carelessly carry about children or others affected with infectious diseases, or who knowingly or wilfully introduce infectious persons into other persons' houses, or permit children under their care to attend any school, theatre, church or any public place where they will be brought in contact with others, shall be liable to a penalty not exceeding one hundred dollars for each and every such offence.

(6). "That every owner or driver of a public conveyance shall immediately provide for the disinfection of such conveyance, in a manner to be approved by the local health authority, after it has conveyed any one suffering from a dangerous infectious disorder, or the corpse of any one who has died from any such disorder, and if he fails to do so he shall be liable to a penalty not exceeding twenty-five dollars; but no such owner or driver shall be required to convey any person so suffering until he has been paid a sum sufficient to cover any loss or expense incurred by him in carrying into effect the provisions of this section.

(7). "That any person who knowingly lets for hire any house, room or part of a house in which any person has been suffering from any dangerous infectious disorder, without having such house, room or part of a house and all articles therein liable to retain infection disinfected to the satisfaction of a qualified medical practitioner, as testified by a certificate signed by him, shall be liable to a penalty not exceeding two hundred and fifty dollars; and any person letting for hire or showing for the purpose of letting for hire any house or part of a house or room, who, being questioned by any person negotiating for the hire of such house or part of a house or room as to the fact of there being, or within six weeks previously having been therein, any person suffering from any dangerous infectious disorder, knowingly makes a false answer to such questions, shall be liable to a penalty not exceeding five hundred dollars, or to imprisonment for a period not exceeding twelve months.

(8). "That when the body of any one who has died of any infectious disease is retained in a room in which persons live or sleep, or any dead body which is in such a state as to endanger the health of the inmates of the same house or room, any health officer or justice of the peace may, on a certificate signed by a qualified medical practitioner, or the application of three persons living in the neighborhood, order the body to be removed and buried at the cost of the city, town or county, within a time to be limited by such order; and unless the friends or relatives of the deceased undertake to bury the body within the time so limited, and do bury the same, it shall be the duty of the said health officer or justice of the peace to have such body buried at the expense of the city, town or county; and any person or persons obstructing the execution of any order made by any health officer or justice of the peace under this section shall be liable to a penalty not exceeding two hundred dollars, or imprisonment not exceeding six months.

(9). "That the municipal or county authorities may provide for the use of the inhabitants of their respective city, town or county hospitals or temporary places for the reception of the sick; and for that purpose may themselves build such hospitals or places of reception, or contract for the use of any such hospital or part of a hospital or place of reception, or enter into any agreement with any person having the management of any hospital for the reception of the sick inhabitants of their city, town or county, on payment of such sum as may be agreed on; or two or more local authorities may combine in providing a common hospital.

(10). "That any expenses incurred by the authorities of any city, town or county, in maintaining a hospital, or in a temporary place for the reception of the sick, a patient who is not a pauper, shall be deemed to be a debt due from such patient to the authorities aforesaid, and may be recovered from him at any time within twelve months after the discharge from such hospital or place of reception, or from his estate, in the event of his dying in such hospital."

Approved March 30, 1882.

Thorough and complete as the foregoing law undoubtedly is, its execution, in a majority of cases, is quite impracticable, unless it should be supplemented by an act for the compulsory notification of contagious and infectious diseases.

31. Compulsory Vaccination In a like category is compulsory vaccination. Notification and isolation may prevent the appearance of an epidemic, yet from the want of disinfection or vaccination a community may be stricken with contagion. During the sitting of the recent Congress on Hygiene in Paris, there was a long discussion on vaccination, when all the speakers insisted on the undoubted benefits of vaccination and revaccination, and, with one single exception, every speaker demanded that vaccination should be rendered compulsory by law.

32. The Life History of the State. It is hoped that the attention of the Legislature may be directed to this matter as a necessary means of ascertaining and preserving an accurate life history of the State.

A faithful register of births, marriages and deaths is not only a matter of the highest social convenience, but is also a test of the morals and welfare of a community. For this the physician waits as a guide to him in forming a plan or *regime* for the health and comfort of his *clientele*. For this the sanitarian waits as the means of determining the physical conditions of any locality, or as a guide to him in suggesting and prescribing the methods by which the public health may be improved and the average of life prolonged. Without it he can proceed only in darkness, or amidst the delusions of false lights. For this the legislator waits as the means of determining the comparative liability of the people to certain kinds of disease and the cause of that liability, that laws may be framed so as to include the largest preventive influence possible and the greatest measure of protection to the several communities of the State. For this the political economist waits as the means of determining the movement of population, the number of marriages, births and deaths which occur annually, that he may estimate the value of health and the cost of sickness to the body politic. For this the court waits as evidence in legal disputes involving questions of births as to time and circumstances, such as heritage, legitimacy or illegitimacy of children, &c. For this the politician waits as evidence of the right of suffrage because of age or nationality, and of the death of parties whose names should be stricken from the registry list. For this the actuary waits to learn the mortuary history of a city, State or nation before forming his life insurance tables. For this the statistician waits before drawing his deductions as to the birth or death rate of a community and its relative healthfulness as compared with other communities. When the statistician has gained access to a register of births, deaths and marriages he has in his hand all the material he requires. The comparative age of the dead will indicate to him not only the amount of health, but the comparative force of various kinds of disease, and from the character of its diseases and the amount of its health the moral state of a people may in a measure be pronounced.

The proportion of marriages to births and deaths is always an indication of the degree of comfort enjoyed, and the consequent purity of morals, and therefore the degree in which education is present or needed. "A large number of children and a large proportion of marriages," says Harriet Martineau, "indicate physical and moral welfare, and therefore a comparative prevalence of education; a large number of births and a small proportion of marriages indicate the reverse." When these circumstances are taken in connection with the prevailing occupations of the district to which they relate we have arrived at a sufficient certainty as to the means of education required, and the method in which they are to be applied.

33. Restrictive Quarantines. At the Paris Congress above referred to, the question of quarantine was brought up by the English delegation, and Dr. Vignard, who was formerly attached to the European Danubian Commission, energetically attacked Dr. Proust, whom he accused of trying to maintain the old faith in quarantines. He observed, very truly, that it was the fear which absence of quarantine provoked that engendered the true spirit of reform, for ignorant municipalities would never vote the funds necessary for sanitary improvement, if they thought the Government would protect them with quarantine. It is only when seaport towns present a soil which cannot be penetrated by exotic morbid germs (cholera, yellow fever and plague,) that they can hope to escape these diseases. Any quarantine restrictive measures that go beyond mere observation and disinfection are not only useless, but barbaric.

34. Inspection of Meat Food. The State Board of Health would again call the attention of the Legislature to the pressing need of some provision for the inspection of food, especially of all meat and milk used as food, with the view of securing sound articles of diet to the people. We would also urge the necessity of killing and destroying all animals afflicted with tuberculosis. Statistics as reliable as can be obtained, says Dr. Strawbridge, make the statement not too broad that there is from three to three and a half per cent. of tuberculosed meat used, and from six to eight per cent. of tuberculosed milk. In Maryland there is no inspection of any kind. The Board of Health has endeavored from time to time to obtain a small appropriation for the appointment of inspectors. Anybody can dump any kind of food into Baltimore, and the people must take it. Meat ought to be inspected when alive, and also during the process of slaughtering. Unless the animal is inspected when alive, and also when the internal parts can be viewed, the inspection is useless. In the inspection of milk, the principal thing is to see the cows that give it, as an assurance that they are not diseased, and to inspect it at its place of delivery.

In the 6th biennial report to the Legislature, 1886, I presented the case of an outbreak of typhoid fever in a Maryland town which was satisfactorily traced to the use of milk from a particular dairy. The dairyman's family suffered from the disease. Chemical analysis showed the well at the cow yard to be polluted, and the milk was no doubt adulterated with water from that well, or at least the milk vessels and the cows' udders were washed with the water, thus conveying germs of disease into the milk. The epidemic had the usual characteristics, which are now so familiar, in epidemics dependent on the specific infection of milk, viz., sudden and localized outbreak, the area of infection being coincident with the area of milk distribution. The theory of the very intelligent physician who attended most of the cases was that the disease got transplanted to the dairy probably in a form which might be readily unrecognized. The inference was that the milk was infected at the centre of supply.

The great lesson of this outbreak is the folly of mixing up the milk business with the family life of the milkman. His business is generally interlaced with the every-day life of his family in a way to make it certain that if disease, either typhoid fever or scarlet fever, by any chance enters his family it is sure to permeate the families of his customers. Another lesson is that the most trifling illnesses, either in man or beast, should not be thought beneath attention, where milk is concerned. Especially should sore-throat in a milkman's family be suspected, for it is known that scarlet fever and diphtheria have been conveyed to many families in the milk supply.

That the sanitary authorities should be empowered to make regulations for the prevention of milk contamination due to eruptive and other diseases of the cow, will commend itself to those who consider that the milk of such animals will surely inflict injury to the health of all who use it. Milk thus contaminated ought not to be sold as food for man, and the health authorities might well be empowered to take steps to prevent the occurrence or extension of diseases of this nature. The enforcement of regulations for securing the quarantine of cows newly arrived on a farm, the isolation of any cow thus affected, have been proved in different parts of the country to afford a material security against the occurrence of these maladies, and might with advantage be generally adopted. The fact that some dairymen enforce them in their own interest is a sufficient answer to the objection that they would interfere with business arrangements. The public have a right to be protected against possible injury through the sale of any cow suffering from eruptive or other diseases transmissible to man, and especially if this animal be one of a herd whose milk is under suspicion of having caused infectious disease among its drinkers.

At the present time there is no control exercised in this State over the infectious maladies caused by the milk or meat of diseased animals. To demand that all owners of herds should take the precautions recognized to be necessary would inflict no hardship, but would even promote the dairyman's interests ; for the loss of milk which occurs, owing to the reduction in the quantity of milk supply when a cow suffers from eruptive or other diseases, is itself sufficiently important to make it desirable that every care should be taken to maintain the stock in good health.

35. Disease Producing Germs in Milk. Prof. R. F. Burleigh gives the following as the conditions and sources under which disease germs are found in milk :

First—Organisms may appear in milk as the result of an infectious disease of the cow, the germs being excreted along with the milk. This has been proved in the case of anthrax and other diseases.

Second—The udder may be locally affected with tubercle, in which case the milk is found swarming with the causative agent of tuberculosis.

Third—Infective material may be carried from the hands of the milker to the milk. Scarlet fever has been transmitted many times in this way. It is well known that certain local diseases of the udder may be carried from one cow to another by the hands of the milker—even tubercle, it is said. How much more certainly, then, would the milk be infected.

Fourth—The evils of "watered milk," unfortunately, are not alone in its decreased nutritive value. Disease germs may be sometimes, not to say frequently, thus introduced. Simply washing the milk pail in putrid water may be sufficient to cause severe disease, as has often happened in typhoid fever.

Fifth—A frequent means of spreading such diseases as scarlet fever is by the contamination of imperfectly cleansed vessels, in houses where the disease is present. Perhaps the milkman leaves a can to be exchanged the next day. It is left in the sick room through the night, and of course collects some dust, and any one who has examined the dust of an ill ventilated room knows that it is full of germs. In this way the disease is carried to the next neighbor along with five cents' worth of milk ; but there is no extra charge for the fever.

No class of people, says Prof. Burleigh, under present conditions, can do so much to prevent diseases caused by consumption of milk as the farmers. Each case already considered implies the method of prevention. If an animal is suffering from any disease accompanied with fever do not use or *sell* her milk.

If there is local disease of the udder never mix the milk with that of other cows. Of course, also, this should not be sold. If the disease is not very bad the milk may be used, provided it is boiled when first drawn, and a second time before it is eaten. Do not allow the same person to milk another cow after milking the one with local disease of the udder until his hands are thoroughly washed.

Never allow a person who has had the scarlet fever to milk a cow for at least six weeks after recovery. Never allow the hired man to water the milk, even if the cow has spilled part, and there is not enough to "go around." If, for any possible reason (as preparing milk for the baby), it is necessary to reduce milk, use only pure water, and, better, boiled water. Milkmen should never leave cans at the house of their customers. All utensils which have held, or are to contain milk, should be thoroughly scalded. By a universal application of these rules, it seems certain that much disease might be prevented. They are not unreasonable or hard to apply. Try them.

36. Ice Cream Poisoning. In the August number of the *Monthly Bulletin*, Dr. I. E. Kennedy, Secretary of the State Board of Health of Iowa, reports the following interesting account of an instance of Ice Cream Poisoning:

"On the fourth day of July, a most extensive instance of ice cream poisoning occurred at Adair, and was reported by Dr. Thomas D. Lougher. There were in all nearly one hundred and twenty cases. Some were very severe and well-nigh proved fatal, though so far as this office is informed, all finally recovered. The symptoms were more or less uniform, differing mainly in severity and were those of irritation of the stomach and bowels, followed by more or less prostration. The cream was flavored with extract of vanilla.

"Several samples of the cream and a sample of the vanilla were furnished this office, and we put them into the hands of Dr. Robert McNutt, chemist, of this city. An examination of the vanilla gave only negative results. Large doses taken by him produced no unpleasant effects. A careful examination of the samples of cream after Vaughan's methods resulted in finding tyrotoxicon present to a large extent. This tyrotoxicon is a ptomaine, and is the result of decomposition, or fermentative process set up in the milk. It may be produced by any and all those causes that lead to the decomposition of milk, by the introduction of a specific microbe, such as uncleanliness, impure water, keeping the milk in mouldy and unhealthy positions, and hauling milk for long distances in the hot sun. It is supposed by many that the "milk sickness" so prevalent in some sections of the country is the result of tyrotoxicon poisoning. We are confident that the many cases of cholera infantum that occur everywhere among children "raised by hand," and especially attempted to be raised on the bottle with the rubber tube attachment, are nothing more nor less than cases of tyrotoxicon poisoning. If we had the power, we would make it an indictable offense for any mother or nurse to inflict upon an innocent child one of these murderous rubber abominations. If a bottle has to be used the rubber nipple if turned and well cleansed, is comparatively harmless, but the *tube* attachment should be consigned to the fire."

37. **Dealing with Nuisances.** I wish to say a few words about the powers of health authorities for dealing with nuisances. The Public Health Acts of 1886 have placed certain responsibilities on sanitary authorities, and given them some powers ; but if the Act were more of a positive character, and less of a permissive one, almost all work required to be done by sanitary authorities could be carried out. But what do we find ? Why, that the Acts are only partially administered, and some portions entirely ignored. For example, many sanitary defects are sought to be removed by the removal of nuisances only, not by structural alterations. The result is, a nuisance is remedied for a time, and then recurs. Section 2 of Chapter 12, of the Laws of 1886, should be more specific in its provisions, in order to insure a more rigid enforcement, which is now interfered with on account of the possible defeat on appeal to the courts. It sometimes happens that such tribunals are very difficult to persuade or convince of the invaluable blessings of sanitation, and will take the side of the person whom they consider grievously op-

pressed by being required to abate a nuisance. More especially is this the case when the aggrieved party is able to obtain the services of a wily advocate, who can twist and contort the meaning of any clause, and will not rest satisfied unless the health authority can prove cause and effect, viz., that certain unsanitary conditions have actually caused disease; and as this is a thing not always possible to do, and as the Board has no lawyer to represent its side of the case, we occasionally fail to satisfy the court. What is wanted are more definite laws of a more positive character, and some provision for counsel to represent the health authorities. If serious nuisances can be proved, it ought to be sufficient, without having to say that disease is actually caused by them.

In the matter of defective drains or accumulations, or deposits of offensive or noxious matters, Section 1, Chapter 12, Laws of 1886, empowers the State Board of Health to investigate the matter and serve a notice on the offending party to abate the nuisance, and if he refuses or neglects to comply, Section 2 of the same Act provides that the said Board shall make complaint, relating thereto, to the Circuit Court, &c.; but so much delay is caused in this way that serious results may occur before anything is done, as nothing under this section can be done until it has been proved that the nuisance exists, and not until then can the order be made for its abatement. A few days or weary hours of neglect in this respect may serve to start an epidemic that will cost thousands of lives, and millions of dollars; all of which could have been saved by prompt and energetic action. As regards nuisances, the Act does not define what a nuisance is positively, but leaves it for the health authorities to do; and the court may even then override their decision, as has been done in more than one instance.

I have pointed out these sections of the Act to show how important it is that the State Board of Health should be armed with definite laws to guide it, so that it may be able to give efficient and speedy help in all cases of sanitary defects coming before it. I am quite prepared to admit that much sanitary legislation has been done, which has had a most beneficial influence, and has proved an inestimable blessing to the communities at large; but we are still travelling on in the true path of sanitary progress, and cannot rest satisfied without a fuller measure of sanitary reform in the future.

38. **Local Boards of Health.** The Acts of 1886, Chap-22, made a marked advance on previous sanitary legislation, by providing that the County Commissioners should, ex-officio, constitute a local board of health for their respective counties, and requiring said board to elect a medical officer of health. This Act has not been carried generally into effect, and in most of the counties where the Commissioners have seen fit to organize as a board of health, in compliance with the provisions of the law, they have elected a health officer at the smallest possible salary—inadequate to justify his giving proper attention to the duties of the positions—no doubt because they preferred not to elect one at all. Under the circumstances, many of the counties are practically without any local sanitary supervisions whatever. Some of the Boards of County Commissioners have construed the law to be of a permissive character, and have not organized as a local board of health. The State Board would, therefore, recommend that it be made unequivocally mandatory, that the salaries of the respective medical health officers be graded according to the area over which they have supervision and the extent of the population of the county. We would also recommend that said officers be appointed by the State Board of Health, and be required to report to the said Board, as often as may be deemed necessary. As at present appointed, they are in no way amenable to the State Board, which has experienced great difficulty in bringing them into co-operation; in fact in getting them to act at all, owing no doubt to disinclination, on the one

hand, to interfere with persons who may have some influence in controlling their appointment, and also on account of the fear of not being sustained by the local board of health.

The sanitary provisions of the Act referred to are not comprehensive enough; and in a few instances efficient county health officers have been removed and replaced by inefficient ones for political reasons only. I may add that, in my opinion, failure in getting really good work done under this Act, is due to errors in the application of the law, and also to the fact that the sections too often use the word *may* instead of *shall.*

As an illustration of the sanitary condition of some rural areas, I may mention that I have found certain localities in a deplorable condition. Slaughter-house yards unpaved, and the drainage lying all around or allowed to run in the nearest channel and in front of residences; privies deep with filth and very offensive, and placed dangerously near to the drinking water wells; all kinds of conceivable deposits of filth lying about and pigs kept in a filthy state at the rear of the houses. This condition of affairs has been found to exist right under the eyes of the local board of health and its health officer, who "did not like to interfere with the right of the citizen to keep his own premises as he pleased," notwithstanding the discomfort and peril it occasioned his neighbors. It is hardly necessary to say, with these conditions existing, zymotic disease was very prevalent, and on my first visit I had to deal with an endemic of typhoid fever, distinctly traced to poisoned drinking water.

I may say, however, that owing to the powers vouchsafed the State Board of Health, under the Act of 1886, Chapter 12, many evils have been remedied; and it may be added, that as a result of work done by this Board during the last ten years, the zymotic death rate has been reduced in the State fully thirty per cent.

With efficient local health organizations, co-operating with the State Board of Health, to secure a more perfect system of health administration, the mortality from such diseases will be still further diminished, and Maryland will become the Hygieopolis of America.

39. **Water Supply of the State.** The usual mode of water supply for most of the towns of this State is by wells sunk at the rear of the houses, some of a very meagre description, but all so constructed as to allow of much surface water running into them; and as a matter of course, in process of time sewage contamination from percolation through the soil takes place. It would be much better to locate the well in front of the house, as far away as possible from the sources of pollution which usually exist in the back yards of houses; but it naturally follows that all dug wells, sunk near dwellings, sooner or later become contaminated. Their construction should be prohibited, or at least regulated by law, for not one is to be found in any town or village of the State, the water of which it is safe to drink. Dr. Edson, of the New York Health Department, says: "During the last summer I have visited twenty towns supplied with water from dug or driven wells; in every instance the supply was polluted, and in most cases the pollution was the cause of the prevalence of typhoid fever." A disease, the existence of which is discreditable to the 19th century, for of all diseases, it is the most preventable. There are two methods of prevention. The first involves the thorough cleanliness of premises; the second relates to avoiding the use of suspicious water, and especially well water, or where this cannot be done, to boil such water before it is used for drinking or dietetic purposes. The Local Government Board of England, in discussing the elealogy of typhoid fever, in a recent report says: "Of 142 epidemics of typhoid fever observed in various localities, in 125 cases the epidemic had no other determining cause than the use of water containing impurities."

At the International Congress of Hygiene at Vienna in 1887, Dr. Bronardel, the eminent French Biologist, who spoke on typhoid fever, and was listened to with the greatest interest, said: "This disease is far more dangerous than cholera, and it is still an open question whether it owes its origin to the decomposition of organic matter, or whether there is a specific virus; but in either event, in eighty cases out of a hundred, the disease is caused by polluted water, and the question of water supply must always take a foremost rank in hygienic administration."

At the same Congress, the influence of drinking water in the production and spread of epidemic disease was fully discussed in Section 3, and Drs. Proust and Ballet, of Paris, contributed papers which adduced strong evidence corroborating the official reports issued to the effect that polluted water is a frightful source of disease, especially typhoid fever and cholera.

Out of three hundred and fourteen cases of typhoid fever occurring in Louisville, Kentucky, in 1884, two hundred and ninety-eight of the persons used well water habitually, and some of the other sixteen did so occasionally. Again, in the famous epidemic of typhoid fever at Plymouth, Pennsylvania, in 1885, involving the sickness of more than one thousand persons, the death of 114, and an actual outlay in money of nearly $70,000. The origin of the disease was traced to the use of polluted water. But to come nearer home, the outbreak of typhoid fever at Pikesville, in this State, last summer, was undoubtedly occasioned by the use of well water, which had become contaminated from surface drainage through a soil highly saturated with filth from privy pits, pig-pen and stable-yards. The examination of the water from several of the wells under the microscope, revealed micro-organisms of both putrefaction and typhoid fever, and in one instance colonies of the micro-organisms of erysipelas, though this disease had not manifested itself.

These remarks apply with equal force to every town and village in the State, where the water supply is drawn from dug wells, a very large proportion of fevers and other serious evils which exist therein, being distinctly traceable to the effects of the water drank by the inhabitants.

Dr. Carl Frankel, of Germany, has recently reported a series of experiments made by him to determine some points of practical importance, as to the relative value of tube wells and "pot" or dug wells. With regard to tube wells, he finds that from their mode of construction they are not liable to contamination from surface impurities, as the pot wells are, but it becomes of the greatest consequence to know whether they receive infective micro-organisms clinging to the sides of the tube. The result of Dr. Frankel's experiments is that, as a rule, the water entering tube wells is absolutely free from micro-organisms. But it still appears that a growth of micro-organisms takes place in the tube wells, and they cling to the sides of the tube. Hence, one way of disinfecting the tube wells is to brush them clean, and then completely pump off the turbid liquid. In case where this proceeding proves inadequate, a concentrated solution of carbolic acid and sulphuric acid dropped into the tube, and left for a day or two, will complete the disinfection. The ordinary "pot well," on the other hand, is incapable of disinfection, and Dr. Frankel agrees with Plagge, that an attempt to keep such wells pure is a hygienic monstrosity.

The chief conclusions to be drawn from Frankel's experiments are that Abyssinian or tube wells are infinitely preferable to the ordinary pot well, and that a disinfection of the tube in the manner indicated above is, as a rule, all that is necessary to make the water quite free from micro-organisms.

In some of the large towns of this State, as Baltimore, Cumberland, Hagerstown, Frederick City, Union Bridge, Westminster, Annapolis, Chestertown, Centreville, Easton, Salisbury, &c., the supply is from water works, and many of the dug wells have become closed. Still, many exist and are frequently the cause of disease. No one will doubt that every town authority ought to provide water from a reliable source to the inhabitants, in every respect fit for domestic use, except as to the matter of ice in the summer, and discourage in every way the further construction or use of shallow wells, which are known to be the most fruitful source of disease.

Unfortunately, however, the water supply of towns when drawn from a distant source is liable to be contaminated by washings, manufactories, farm house refuse, and the drainage and sewage from residences erected in the immediate vicinity of storage lakes. The tributaries of these lakes, often draining a large area of country, gather in their course deleterious organic matters, which are deposited in the storage lakes, coating their beds and banks in some cases to a depth of several feet with solid refuse more or less obnoxious. There is no reason, however, why these sources should not be protected by the operation of an efficient law for preventing their pollution; but notwithstanding such a law does exist, there is not a river or hardly a stream of water, however small, that can be said to be moderately "pure" throughout its whole course, and there are very few important water-sheds some portions of which are not destroyed by pollutions of some kind.

If the evil ended here it would not be so serious as it really is. In several instances water supplies of cities and towns are fed by tributaries which are known to be polluted with "Town Sewage." I do not propose in this report taking any part in the *odium sewagicum*, which gave rise to such unjust criticisms of my last report, but shall limit myself to pointing out generally the injurious effects of filthy drinking water on the health of the people, and to showing that in most, if not in all cases, the practice of casting refuse into the rivers and streams is not only injurious to health, but that its prevention is easy, and that in many instances remedies are available which would more than repay—in the utilization of the waste products—the cost of prevention.

40. **The Water Supply of Baltimore** may be regarded as one of the great sanitary works of the century, and no pains or expense should be spared to preserve its purity. If it were merely a question between the existence of manufactories or the economical drainage of villages, farm houses and private residences on the one side and the preservation of the purity of a river, stream or lake not used as a water supply, but simply as "a thing of beauty" on the other, the stream or lake might be sacrificed. But this is not the case with the water supply of Baltimore, and now that it has become a question of public health and life, it is to be hoped that some efficient steps may be taken to prevent the contamination of every tributary and storage lake connected with the system; and that the city will in its turn provide the means of filtering all the water before it enters the supply pipes, as is done in the large cities of Europe, including London with its 5,000,000 inhabitants and Berlin with its 2,000,000.

41. **Pure Water Necessary for Health.** Pure water is as necessary for health as good food and fresh air; consequently the importance of using pure water for drinking and cooking cannot be over-estimated.

Mr. Edwin Chadwick, late Commissioner of the Public Board of Health of Great Britain, in a paper read to the International Congress of Hygiene at Vienna, said: "Experience has shown that infusions of peat are seriously injurious—that in flood periods they produce serious dyspepsia and cannot be drunk with impunity." Speaking of the London water supply he says: "At the sources of the Thames supply, as at Pangbourne, the water is clear and brilliant, and stones may be seen clearly at the bottom, some twenty or thirty feet deep. The water drank there is highly aerated and refreshing. Some way further on the water was taken up storage in open reservoirs. There *algae* were generated, and died with extraordinary rapidity, leaving pernicious infusions of decaying organic matter. Taken from thence for urban distribution, under the intermittent system of supply it was delivered to cisterns, where it stagnated, was further de-aerated, and it absorbed town air. In the lower districts, in courts and alleys, in tubs over cesspools, it absorbs the cesspool air. Taken into over-crowded bed-rooms, and kept stagnant in open vessels, it absorbed the pernicious foul air of the over-crowding. In these several conditions, the person drinking the water at its source may be said to be drinking pure and invigorating air. Drinking it after stagnation in the uncovered reservoir, he would be drinking it de-aerated and with much vegetable and animal infusoria and some decaying animal matter. Drinking it after stagnation in a house cistern, he would be drinking inferior town air. Drinking it in the immediate vicinity of foul cesspools, he would be drinking cesspool air, &c.

Like the effects of vitiated air, those of impure water may be slow and insidious, but not the less important, or the less to be dreaded. In the summer most households drink a good deal of water, and, as everybody knows, summer temperature tends to develop whatever potency for mischief water impurities may possess. What that potency may possibly be has been recently shown in a very startling light in the discovery by Dr. Klein, the celebrated English pathologist, of typhoid or enteric fever germs in polluted water, and which has the power, whenever taken into the stomach, of propagating themselves upon its membrane, and finally of spreading over and poisoning the whole organism.

The purity of water is undoubtedly a matter of precise importance at all times, and in the summer time especially; and efficient filtration is allowed to be a natural, cheap and easy method of securing purity. Householders who derive their water from public water works ought, properly speaking, to have no trouble with filtration of their water. It ought to reach them perfectly fit for drinking. It is idle to say that the supply of a city, however large, cannot be filtered. Such twaddle is either the offspring of ignorance or a disinclination to introduce modern processes in connection with water works. In every case a purifying process is available, and the expense need not be serious.

The annual death rate in New Orleans from typhoid fever is only 16 per 100,000 of population. The sewage of New Orleans cannot pollute the water supply, rain water from tanks or cisterns above ground being used. In Philadelphia, where the water supply comes from a source known to be contaminated, the annual death rate from the same disease has increased in a few years from 56 to 66 per 100,000 of population. The increase has been *pari passu* with the increased pollution of the water supply, and the city authorities are now discussing the necessity of purifying the supply by filtration. It would be well for Baltimore to anticipate the *inevitable,* by beginning at once the construction of proper filtering beds; and so far as the Gunpowder supply is concerned by substituting for the present catch basins a natural flow from a point above the chief sources of contamination, whereby the purest and healthiest water can be obtained at far less expense than by the contemplated system of pumping from Gay Street lot to Guilford and Druid Lakes. Looking at the matter from a purely sanitary standpoint, the natural flow is incomparably the best method of obtaining water for the city of Baltimore.

42. Sanitary Defects in Dwellings. I wish to state generally to the Legislature what, in my opinion, are defects in the sanitary condition of our dwellings; and at the outset, make bold to say that there are very few existing in the State that could claim to be, properly speaking, "sanitary dwellings." When I say that there are very few sanitary dwellings, I do not wish to imply that all houses are more or less insanitary, but what I wish to say is that very few exist that are free from some sanitary defect or other, although they may not be absolutely of a dangerous character.

I will start my account of our present dwellings with the assertion that the dwellings of the rich (or upper class) have their defects within the house, while those of the poor have them within and without. The latter remark may apply to both classes, but not to the same extent. The first and foremost provision should be dryness of site. Not enough attention is given to this matter, and many architects do not insist on concrete foundations. I consider it absolutely necessary, in order that a building may be free from dampness, not only that the sub-soil should be drained, before building operations begin, but that concrete all over the surface of the site, as well as for the foundations, should be insisted upon. This is an important desideratum, yet how many houses are built in this way ? At the surface of the earth provision is sometimes made for a damp course, but even this is not by any means a uniform practice. How many buildings have this provision ? Very few. What is the result ? Absorption takes place, and in wet seasons dampness is seen for some distance up the wall ; and where paper is on it, which is generally the case, fungoid growths are manifest on the surface after drying, which may lead to irritation of a sensitive bronchial mucous membrane. Very little, I am afraid, will be done to old buildings in this matter, on account of the expense, and also because one cannot say positively that it has been productive of disease, although we know that it frequently is.

In reference to this matter, I see no reason baring the expense, why old insanitary buildings may not be converted into sanitary ones, by taking out the bricks of the foundation two at a time, wedging up and putting in a damp course. This would, other things being properly arranged, make the house a dry and healthy one. I know the proceeding would cost something, and that many objections would be raised to it, and I am, moreover, pretty certain that very few owners of houses would be willing to carry it out. Nevertheless, I consider it a most valuable provision for old buildings, and, if adopted, would prevent many diseases that now occur, such as bronchitis, rheumatism, and a general lowering of the vital force, as dampness is now universally conceded to be a fruitful source of disease, especially consumption.

Except in the city of Baltimore, no provision whatever exists for dealing with buildings. People are allowed to erect whatever they choose, with what materials they think fit, and to construct all sorts of conceivable dwellings. Some are built back to back, others half finished, the foundations of the houses being of the most meagre character. Drains are put in of all sorts and sizes of pipes, and conveyed into the nearest ditch or stream. The sanitary appliances are of the most primitive type; the drinking water wells sunk at the rear of the house, and in the midst of drains, cesspools, and privies.

I need scarcely say no inspection of these dwellings ever take place; they are occupied as soon as erected, and no questions asked. In Baltimore, of course, this state of things is somewhat different. The authorities are armed with "Ordinances," such as they are; but the sanitary arrangements even in this great city, with nearly 500,000 inhabitants, are not of the most comprehensive nature. The health authorities, except in the matter of plumbing, have no power to condemn unsanitary dwellings, and there is no supervision over their construction, except by the Inspector of Buildings, whose knowledge of sanitary laws is not of the very highest order.

In order to deal properly with these matters, laws of a comprehensive character should be framed, having for their object the better regulation of buildings, and power given the sanitary authorities, rural as well as urban, to enforce certain sanitary regulations, especially with reference to drainage, ventilation, &c. Such laws if made compulsory, would, in my opinion, be a great blessing; and I am convinced, if properly executed, would lead to permanently good results, and place our towns and the State at large in a much better sanitary condition, and consequently safe condition.

43. Drainage of Houses. I next wish to say a few words about the drainage of houses. Formerly many houses were built with drains running under the floors, and these drains nothing but ordinary pipes laid end to end, without any joint beyond a little clay or putty. In country and village houses, drains are, as a rule, conveyed from the building to a catch-pit, causing the drainage to find its way either into it by its own natural inclination, or overflowing on the adjoining land.

In Baltimore the general drainage of all property, at the present time, goes either into miserably constructed storm water sewers, or into cess-pits in the back yard or cellar, which now exist in the city to the extent of 70,000 or 80,000. The house connection with these sewers or cess-pools is too often left to the builder to do with as he likes. Nothing could be worse than the Baltimore system.

Another bad example of house drainage is that from the sink of a kitchen. In many cases this is connected with the general system. In country houses one frequently sees simply a hole in the sink, a channel being made, with an outlet in the wall. This, of course, gives rise to a very serious nuisance, causing saturation of the walls of the kitchen with sewage matters, which are always more or less offensive. The sooner this arrangement is remedied the better. All drains connected with buildings should be laid in concrete, with suitable fall and water-tight socket pipes.

No drain should pass under any building unless absolutely necessary, in which case it should be laid in concrete six inches thick all round. It should also have efficient means of ventilation at each end of such portion as is within the building. The drains from the house should also be provided with a suitable trap and air inlet on the house side of the trap leading to the sewer, also with a ventilating shaft carried above the roof of the house. The most important thing in a trap is its self-cleansing powers—that is, that every part of the inside of a trap shall be washed by its own action in the passage of the water through it.

In his "Lectures on the Science and Art of Plumbing," Mr. S. Stevens Hellyer has laid down the principles on which traps should be constructed, a synopsis of which is here copied:

1. The trap should be free from all angle corners, and places where filth could accumulate and generate noxious gases.

2. A free way should be made for the discharges to pass through the trap without breaking their form—*i. e.*, the trap should be like a round pipe, so made or bent as to form a water-seal of about 1½ or 2 inches deep.

3. The body of the trap should be smaller than its inlet, so as to hold as small a quantity of water as possible.

4. The minimum size trap should be used consistent with circumstances, that is the size of the waste pipe, and the flush of the water likely to be sent into it.

5. The inlet or mouth of the trap should be so arranged that the water-flushes shall fall upon the "standing water" of the trap with a vertical pressure, so as to drive everything foreign out of the trap, and to entirely change its previous contents.

6. The inlet side of all traps fixed upon drains outside the house should be open to the atmosphere.

The same author states that any trap which in its action is self-cleansing, and is sufficiently water-locked to allow for evaporation, and to prevent "blow-downs" or back-draughts from coming through, may be used with safety, if of a smooth and non-corrosive nature, and always provided, that the trap can be made to maintain its water-seal by proper ventilation against syphonage, &c.

Sanitarians all agree with Mr. Hellyer that waste-pipes from sinks, baths, lavatories, &c., should discharge with open ends into intercepting traps (either under or over their gratings), outside the external walls of the house. But they are not all agreed on this matter with regard to soil pipes. Soil pipes may be severed from the drain, and made to discharge with open ends into intercepting traps; but they and their belongings must be properly treated. The opening out of waste-pipes, soil pipes and drains to the atmosphere is one great method for excluding noxious gases from the interior of houses; but in cold countries the use of such open traps for intercepting either soil pipes or waste pipes cannot be used on account of frost.*

For ordinary water-closet purposes the medium size "Anti-D trap" is probably the most self-cleansing trap yet devised. It holds, according to its inventor, only two pints and a half of water, and its entire contents are changed by an ordinary flush of water from the water-closet under which it may be fixed; and this is more than can be said of nine-tenths of the traps now in use under water-closets. When fixed upon a properly ventilated soil or waste pipe—having its branches also ventilated—it cannot be unsealed by a discharge of the largest body of water, from a slop-pail or other vessel that can be passed through a water-closet or slop-sink, no matter on what floor such fittings may be fixed, nor the height at which they may stand above the trap. On usage, every part of the inside of this trap is scoured out by friction, and there are no places where anything can accumulate and become foul.

44. **Water-Closets** are now regarded as a most important sanitary convenience, and are to be found in almost every dwelling of the better class. In point of fact, scarcely any house, worthy the title of dwelling, in city or town, will be found without them. This domestic convenience is considered by the well-to-do, especially, as a kind of luxury. No doubt it is; but I am bound to say that, as they are generally found, they are luxuries of the most dangerous kind. I am quite willing to admit that, if all water-closets were constructed in accordance with sanitary requirements, instead of being placed in houses haphazard, as is too often done by "jerry" builders, their danger would be

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* See "The Plumber and Sanitary Houses," p. 74.

reduced to a minimum. It requires great care to construct them so as to be perfectly free from danger.

It is true that provision is made in most instances for carrrying the soil pipe outside the building, and connected with a ventilator equal in diameter to the soil pipe; yet, with all this, the open mouth of the receptacle is within the dwelling. It would be best that no water-closet should be placed within the four walls of any house, if it were practical to avoid doing so. They should, if possible, be placed in a special corridor quite outside, and be disconnected by means of a separate passage, having cross windows running at right angles to the walls of the house. By this means it would be quite impossible for sewer air to enter the dwelling, all other arrangements being perfectly in unison. No retainer under the pan either should be allowed, except a properly arranged trap, which, being thoroughly scoured at each flush, and supplied with a free flow of water, cannot be considered a retainer. I am not a believer in the water carriage system of sewerage, for it does not by any means solve the sewage disposal question, though it may remove excrementitious matters away from the immediate vicinity of the house. While on this subject I would further add that I would banish all existing privies or cess-pits, as they are undoubtedly the most abominable contrivances ever invented. They are creators of nuisances and factors of disease, and the sooner they are got rid of the better. I believe many of the zymotic diseases that develop in our midst, viz: typhoid fever, diphtheria, diarrhœa, &c., may be mainly attributed to them. We know that typhoid fever is most frequently propagated by contaminated well water, as a result of soakage from privies or privy-pits.

In reference to this subject, I feel bound to state that the sanitary condition of some of our hotels and lodging houses, to the maintainance of which the public contribute as guests, is most deplorable. People go into them, unconscious of their insanitary condition, to seek comforts for which they pay and contract disease from which they die. What is the condition of these houses? We find all the external architectural embellishments and beauty of design which ingenuity can produce. So far as external appearances go, nothing more could be desired; nor in the internal arrangement of the rooms. But then all has been said. The sanitary arrangements are of the worst possible character. In the very center of the building, it may be, surrounded by bed rooms, the water-closet is placed. Then, of course, the soil pipe has to pass down inside underneath the building. The result of this arrangement, unless the plumbing is properly executed, is to convey sewer gas into the building. Every building of the kind where the unwary public lodge, if not private dwellings, should be subject to regular and systematic sanitary inspections.

In regard to private dwellings, I may add, that a common fault in connection with all water-closets is the soil pipe, when, as is too often the case, it is it is placed in the most convenient position, and passes down through the pantry, china closet or kitchen, or even through a bed-room. What may one reasonably expect, should any corrosion of the pipe, as frequently happens take place? Cases of this kind have occurred, and illness of a low type was the result.

If the water-closets and all their belongings cannot be placed outside the walls of the house, we should, at least, insist upon the soil pipe being fixed outside the external walls wherever it is at all practicable. With proper plumbing, that is were the closet valve does not leak into the outside soil pipe, and the discharge ends of such pipes are carried down below the ground level, there is very little risk of freezing, and even this small risk may be avoided by boxing, All soil pipes, where practicable, should be "disconnected" from the drain to prevent them from becoming conductors of drain air or sewer air into the house.

There is one more point in connection with water-closets I must not fail to note. The ordinary pan closet, which is still used in many houses, is the most disgusting and abominable system under heaven. If any system is calculated to be filthy, and lower the moral and physical health of the people, it is the pan system, such as we sometimes see, even in this enlightened sanitary period, put into new houses by consequential Sir Oracles, who affect to despise the teachings of sanitary science. Their use may be regarded as one of the most common causes of zymotic diseases, and the presence of typhoidal and diphtheritic types of disease have been traced directly to the use of such closets.

It would be greatly beneficial to the public if all buildings, and especially State institutions were brought under the sanitary supervision of the proper health authorities, particularly with reference to their drainage, ventilation and water supply. It is a mystery why an act to regulate plumbing should be deemed necessary to protect the health and lives of people in Baltimore, whilst there is no power over plans for the plumbing in buildings two feet beyond the city limits. Although one is an urban and the other regarded as a rural district, there ought not to be any essential difference in the powers vouchsafed the health authorities of the two.

45. **The Disposal and Purification of Sewage.** That the best method of disposing of and purifying sewage has always been an open question, is evidenced by the fact that during the past thirty or forty years several hundred patents have been taken out for the purpose. Many of them were palpably absurd and chimerical, while the majority consisted in the addition of chemical solutions and solids, which not only added to the bulk of the sewage, but set up mischiefs that were worse than the effects of simple sewage. Still we have been getting nearer and nearer to the desired object, and it is possible that we are much closer than most people suspect.

46. The Need of a Sewerage System for Baltimore. One of the most difficult questions with which this city has to deal is that of getting rid of its excretal sewage. The surface drainage of the city is all that could be desired, and should not be interfered with, except in so far as it may be necessary to carry off storm water in low lying districts; but to get rid of the 70,000 or 80,000 privy cesspools, and take care of the excretal and household sewage, in a manner to satisfy the requirements of health and economy is a momentous problem, not only for the citizens of Baltimore, but for the people of the State. How to get rid of the sewage of the city without offence to health or detriment to other interests and communities than that of Baltimore, is a question which has not hitherto received the attention it merits.

It is difficult to name a city in which the application of a new drainage system has not left foul evidences of the nuisance it has been supposed to remove. Although by carefully trapping the house from the sewer the more immediate danger of perpetual inhalation of sewer gases has been removed, yet the open sewer grates, without any attempt at ventilation, emit the foul smell of the sewer into the streets. The worst case of the kind is probably at Washington city, where the ground is so flat, and the fall so slight that it may readily be imagined a semi-stagnant condition of the refuse in the sewers may exist. But not at Washington only are such nuisances to be found. At Boston a few years ago the discharge of sewage at low tide, through the mouths of the main sewers, led between tides to the pounding back of the sewage and the compulsory forcing of the pent-up gases into the streets. This has since been remedied, by discharging the sewage well out towards the sea. At Chicago the sewage is delivered into the lake, and reveals itself by large sheets of foul water, that reach even to the cribs from whence the water supply of the city is drawn.

The imperfections of the great system of drainage of London are well known; and it is strange that, at the very centre (the House of Parliament,) from which emanate the laws providing for the non-pollution of rivers, the worst example probably in the world should be found of a river (the Thames) polluted at one time to such a degree as to make it impossible for legislators to remain at their posts, and at present offering in its course an example of filth which it would be difficult to surpass. Mr. Robert Rawlison, the great English engineer, says that the sewage experiment of London is a failure, whilst he thinks the city of Berlin has enjoyed the benefit of successful sewage farms for fifteen years. But the great Virchow is evidently skeptical as to the benefits of the Berlin system, for he has recently declared to the Berlin municipality that "no other metropolis presents a more striking example of so terrible a visitation among children in the form of diphtheria, scarlatina and measles than Berlin." Dr. Alexander Mueller, the renowned German scientist, coincides in this view, for in lecturing on the main drainage of Paris in that city some years ago, he took occasion to impress upon his hearers who wished to study the Berlin system of sewage disposal, not to allow themselves to be piloted about by blind enthusiasts only, but to go round with cool heads, not once only, but on repeated occasions and at various seasons of the year: He said: "Many a time and at many a spot the Berlin farms look exceeding beautiful, while at other times, and in other portions of the area covered, the view is desolate and forbidding." He further says: "It is not so many years since the Berlin sewage farms were a public nuisance—so much so that the Government found it necessary to order a survey, and to appoint an official supervisor for the works."

Should the municipal authorities of Baltimore ever attempt to empty the sewage of the city, amounting at present to 20,000,000 gallons per day, with an increase in the near future to 50,000,000 daily, into the Chesapeake Bay, they will be guilty of precisely the same fault that London formerly committed, and from which the people on the Bay of Naples still suffer. This once beautiful bay has become a reeking cesspool from the sewage matters which flow into it from Naples, a city of 400,000 inhabitants. "During the summer," says a French journalist, "many of the owners and occupiers of villas upon the banks of the bay have had to abandon their homes in consequence of the stench exhaled from its polluted waters." Should the sewage of Baltimore, in an unmodified form, be permitted to enter Chesapeake Bay, the fisheries and oyster beds will be hopelessly ruined by the foul liquids. The deposits of waste substances, in such large quantities, will not only discolor and poison the waters, but the beds and banks of the Bay and its tributaries would soon become coated with solid refuse more or less pestiferous.

A curious incidence of the danger which sewage may contain when turned into a water-way, is afforded by the report of the Tyne (England) Board of Conservators, who state that a "most serious injury was caused to the fisheries of that river by sewage from the Corporation of Newcastle." A small flood took place at the end of July, when the river was exceptionally low, and the tides not high, the result being that the poisonous material was carried into the Tyne, and every kind of fish for eleven miles of the tide-way was destroyed. "So poisonous was the material that the fishermen's nets were tainted."

Where the argument is used—as it commonly is—that to pour sewage into a water-way cannot be hurtful, but rather an advantage to the fisheries because the finest fish are often found feeding at the mouths of drains, it is forgotten that this only occurs where the sewage is fresh and the quantities small. The sewage of Baltimore would reach the Bay, not only in large quantities, but in a more or less advanced stage of fermentation, and in this condition fish would be directly suffocated, either through the gills becoming clogged by the deposit on them of matters in suspension in the water, or by the water being itself deprived of oxygen by matters either in suspension or in solution in it.

But not less serious than the actual destruction of fish would be the injury caused to the spawning beds and eggs of both oysters and fish by the gradual deposit of the matters held in suspension in the liquids discharged from sewers; while the destruction of insects and other life forming the food of fish would be a further aggravation of the evil. This opinion is but the echo of the views entertained by the Boards of Conservators throughout England, who have found, after many years' experience, that in many cases the polluted state of water-ways is the only impediment, or at least the most serious impediment to the development of the fisheries.

The only example of a sewerage system, of which I am aware, that can be successfully applied at Baltimore, is that of precipitation and filtration as practiced so successfully at Acton, England, by the "International Water and Sewage Purification Company,"

47. A Practical Sewerage Scheme for Baltimore. The only example of a sewerage system, of which I am aware, that can be successfully applied at Baltimore is the "International System," patented and promoted by the International Water and Sewage Purifying Company, of London. It is claimed for it that while it produces an effluent water, which is perfectly innocuous to the river water into which it may flow, it retains in the sludge a larger portion of the manurial qualities than is possible with the lime process.

For some time I had been watching with interest the developments of this new system of treating town sewage in England, and in my recent visit to that country I was shown the whole process at Acton, a large and rapidly growing western suburb of London. The method is quite simple, and comparatively inexpensive, except in so far as the plant and the laying of the necessary transportation pipes are concerned. It consists in effecting rapid precipitation of the solids and deodorization of the supernatent liquids, and in the removal of the organic matter in solution by passing the effluent fluid through specially constructed filter beds.

The precipitant and deodorant is known as "ferozone," and the filtrant as "polarite." The evidence of numerous well-qualified authorities goes to show the importance of this method of treating sewage matter, both from an economical and sanitary point of view. The effluent produced at the Acton works is the purest, and the sludge the least in bulk and best in quality yet produced.

The precipitant (ferozone) flows with the raw sewage into a large precipitating tank of 130,000 gallons capacity. Of these there are three side by side. Subsidence is allowed to take place for a period of from one to three hours, after which the top liquid is run off from the surface by means of a floating arm direct on the top of the filter-bed, which is made up of sand as a top layer, then a layer of the filtrant, the bottom being made up of gravel. The resulting filtered effluent is bright, clear and free from any objectionable smell. These filter beds have been in use more than twelve months, and the only cleansing found to be necessary is the removal of the surface layer (one or two inches) of the sand. The sludge precipitated is of considerable value as a fertilizer, since the use of lime, which is so highly objectionable and causes the loss of ammonia, is entirely avoided. By the use of the filtrant (polarite) in properly arranged beds it is unnecessary to acquire large areas of land for irrigation. These beds never require changing, a slight rest of a few hours occasionally being all that is needed to effect revivification, coupled with a flushing or cleaning of the top sand. These beds will filter sewage effluents at the rate of 1,000 gallons per square yard per 24 hours, with better results than can be obtained by land filtration at the rate of 1½ gallons per 24 hours; or, in other words, one acre of filtering area, containing a layer of polarite and sand, mixed in equal proportions, will do more efficient work than 666 acres of land.

The system above referred to is not confined to the laboratory, but is daily working with most satisfactory results at the sewage works of Acton. Here the sewage of a large and growing district is received, treated without the addition of lime or other bulky substance, and an effluent is obtained which is almost the *ne plus ultra* of chemists. The mechanical operation is exceedingly simple, and so is the chemical action, but its importance in dealing with the difficult question of sewage treatment is very great.

Below will be found some interesting scientific particulars :

Abridged report by Sir Henry E. Roscoe, M.P., F.R.S., LL.D., Ph.D., &c.

10, Bramham Gardens, Wetherby Road, S. W.,
August 20th, 1888.

To the Directors of the International Water and Sewage Purification Company.

Gentlemen : I have at your request investigated, and now beg to report upon your process for the Purification of Sewage as carried out at Acton.

For this purpose I visited the works at Acton on Monday, July 9th, and found that the water carrying sewage ran along a channel into which was flowing a turbid solution of your precipitant known as "Magnetic Ferrous Carbon." *

This mixture flows with the raw sewage into a large precipitating tank of 138,000 gallons capacity. Of these there are three side by side. Subsidence is allowed to take place for a period of from one to three hours, after which the top liquid is run off from the surface by means of a floating arm, direct on to the filter bed, which is made up of sand as a top layer, then a layer of your preparation, known as "Magnetic Spongy Carbon,"† the bottom being made up of coarse gravel.

The names used above are not chemical but commercial designations.

I found the resulting filtered effluent to be bright, clear and colorless, and free from any objectionable smell.

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* Ferozone. † Polarite.

Many samples of the tank liquid and the filtered effluent were taken by Mr. Lailey, the engineer to the Acton Local Board, and also by my assistant, Mr. Joseph Lunt, B.Sc., and these were analysed.

I have always found that the filtered effluent was equal in appearance to the sample taken on the day of my visit, viz., bright, clear, colorless and free from objectionable smell. Many samples of this filtered effluent have been analysed. The average results obtained are given in the following figures :

ANALYSIS OF FILTERED EFFLUENTS.

	Parts per 100,000.	Grains per Gallon.
Chlorine	6.4	4.48
Free Ammonia	0.406	0.284
Albuminoid do.	0.025	0.018
Oxygen absorbed from permanganate in 4 hours	0.325	0.228

Samples of the effluent have been kept, in absence of air for nearly two months, and have still retained their good qualities.

They exhibit no trace of putrefractive change, but have rather undergone improvement, inasmuch as in most cases a slight green growth has taken place, showing that the effluent is in a condition to be acted upon by the natural influences which will tend further to improve the water whilst flowing along a stream.

But it is to be observed that the amount of organic matter, as measured by the quantities of the two forms of ammonia, is above the limit of a safe drinking water. Hence whilst the effluent is an excellent sewage effluent and may be sent into the river at the present outflow without danger, it is obviously unfit for drinking purposes.

I consider the removal of all the suspended matter to be a very good point in favor of the system. Another is the intermittent nature of the filtration.

This is assisted and the filter kept in good order by frequently raking over the surface, removing the surface layer of sand and replacing it by washed and clean material.

The tank effluent before filtration is always turbid, and has a distinct but not very offensive smell, but even this becomes clear on standing. It contains more organic matter than the filtered effluent. Many samples have been analysed, with the following results :

ANALYSIS OF UNFILTERED EFFLUENTS.

	Parts per 100,000.	Grains per Gallon.
Chlorine	6.2	4.34
Free Ammonia	1.1	0.77
Albuminoid do	0 071	0.050
Oxygen absorbed from permanganate in 4 hours	0.652	0.459

These numbers contrast favorably with a series of analyses made of the raw sewage, which, however, I do not quote, as the samples taken from time to time varied greatly in composition.

The porous nature of the oxide, which is used in the filter, its complete insolubility and its freedom from rusting, constitute in my opinion its claim to be considered a valuable filtering material. A sample of this filtering material taken at Acton gives the following results on analysis :

ANALYSIS OF "MAGNETIC SPONGY CARBON" (POLARITE).

Magnetic Oxide of Iron	53.85
Silica	25.50
Lime	2.01
Alumina	5.68
Magnesia	7.55
Carbonaceous Matters and Moisture	5.41
	100.00

The material called "Magnetic Ferrous Carbon," used for mixing with the sewage contains mainly Sulphate and Magnetic Oxide of Iron.

A sample taken on the works at Acton gave the following numbers on analysis :

ANALYSIS OF "MAGNETIC FERROUS CARBON" (FEROZONE).

Soluble Constituents.	Ferrous Sulphate	26.64
	Aluminium Sulphate	2.19
	Calcium Sulphate	3.30
	Magnesium Sulphate	5.17
	Combined Water	8.20
	Moisture	24.14
Insoluble Constituents.	Silica	11.35
	Magnetic Oxide of Iron	19.01
		100.00

The soluble portion of the material, called "Magnetic Ferrous Carbon" when mixed with the alkaline sewage, forms a slight precipitate, and the insoluble portion (Spongy Magnetic Oxide) assists in the subsidence, and from its porous nature may also act as an absorbent of some of the organic matter.

About 8 grains per gallon of sewage is added during the flow into the precipitating tank, and after from one to three hours' subsidence the liquid is drawn off. The sludge remaining is run into a well, whence it is pumped into a press and the pressed cakes dried in a current of hot air from a coke fire. The sludge thus dried is not liable to offensive decomposition. I have come to the conclusion that the precipitation process alone is not capable of producing a bright, clear effluent, nor complete deodorization. This is especially the case where the sewage is strong or is undergoing incipient putrefaction. Hence filtration is necessary for obtaining a satisfactory effluent.

As the sewage at Acton is received in the fresh state, the liquid has not yet lost its dissolved oxygen, nor has the greater part of the organic matter been broken up into soluble, and, therefore, more hurtful products.

The larger portion of this organic matter is therefore removed partly by natural subsidence and partly by the precipitate formed by the Ferrous sulphate. The filtration removes all the suspended matter, and a further purification is effected by the porous Magnetic Oxide which on absorption of organic matter in its pores oxidizes it by help of the dissolved oxygen existing in the liquid.

The filter beds at Acton have now been in use for fourteen months, the only cleansing having been the removal of the surface layer of sand.

I am, gentlemen, yours truly,
(Signed) HENRY. E. ROSCOE, F.R.S.

Report of Professor Henry Robinson, M. Inst. C.E., Late President of the Society of Engineers, author of "Sewage Disposal," &c. :

7, WESTMINSTER CHAMBERS, LONDON, S.W., June, 1888.

"I have visited the Sewage Works at Acton on two occasions, the first shortly after their completion, and the second after they had been in operation for a year. My visits were for the purpose of observing the results of the International Company's system for purifying the sewage. In the first instance material called "Magnetic Ferrous Carbon" * is applied to the sewage as a precipitant, producing immediate deodorization and precipitation. The combined chemicals and sewage are allowed to remain quiescent in tanks for a period of two or three hours, after which the supernatent water is passed through a filter bed composed of "Magnetic Spongy Carbon", † with a layer of sand upon the top to remove suspended matter. The action of this "Magnetic Spongy Carbon" † filter is remarkable, producing a permanently clear and inodorous effluent within so small an area as to lead me to form a very favorable opinion as to its being a valuable adjunct to sewage disposal works where a high degree of purity of the effluent is essential. No lime whatever is used in the process, which results in the bulk of the

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* Ferozone.

† Polarite.

sludge being minimised and its manurial value increased. “(Signed) Henry Robinson,
“M. Inst. C.E.”

It has been carefully examined by Dr. Angell, F.I.C., who reports the following experiments, demonstrating the potency of the material as an oxidizer :

“Experiment No. 1.—Ordinary domestic sewage was passed through 9 inches of ‘polarite.’ By the permanganate test it was found that 94 per cent. of the oxidizable organic matter was destroyed or rendered innocuous.

“Experiment No. 2.—To demonstrate the destruction oxidation of foul gases in solution. Taken a solution of sulphuretted hydrogen, equivalent to 4.2 grains of oxygen per gallon. After filtration by permanganate test, not a trace of sulphuretted hydrogen was left.

“Experiment No. 3.—I find that ‘polarite,’ notwithstanding that it permits the free transit of air and gases, is quite impermeable to atmospheric germs. An organic solution containing gelatine, cabbage water, turnip juice and urine, was found to keep unchanged for more than a year, the air being perfectly sterilized by its passage through the granules of ‘polarite.’

“These and other tests to which I have subjected the material satisfy me that it is a very valuable substance for the filtration of water, sewage effluents, air and gases.” (Signed) A. Angell, Ph.D., F.I.C.,
Public Analyst.

48. Physical Education of Girls. There is no branch of education which stands more in need of revision and improvement than that which relates to the bodily health and growth of children and young persons, and which is now commonly known by the name of *Physical Education*. This is more especially true of the education of girls, particularly such as are brought up at boarding-schools.

49. Sources of Ill-Health in Females. The three grand sources of ill-health in women are: 1st, The want of sufficient bodily exercise; 2d, Constrained postures; and, 3d, The use of stays. These all originate in the anxiety of parents, more particularly mothers, to obtain for their children the three following benefits: 1st, A great number of *accomplishments*, as they are termed; 2d, A genteel carriage; and, 3d, A fine shape. Never were objects more completely defeated through injudicious methods of obtaining them; the actual results being, too often, in lieu of real substantial benefits, the following lamentable evils: 1st, A smattering of various kinds of knowledge, which are found of little practical utility in the actual business of life, with a great deficiency of that kind of knowledge which would really be useful; 2d, General impairment of the health; 3d, A bad carriage and figure, and, too often, actual deformity of body.

Although these evils are notorious to all who observe what is passing around them in society, and although they have been the theme of invective in the writings of physicians and moralists, it cannot be imagined that those most interested in the subject, the fathers and mothers of the rising generation, are in reality aware of their causes, nature or extent; were they so, they would not surely countenance the system in which they originate. It is for this reason that we do not think the pages of this Report can be better appropriated than in making them generally known, and in endeavoring to impress them forcibly on the minds of parents.

50. Want of Exercise in Fashionable Boarding-Schools. Boys enjoy exercise freely, and of the best kind, in the unrestrained indulgence of their youthful sports. By means of these, every muscle of the body comes in for its share of active exercise, and free growth, vigor and health are the result. It would be happy for girls if some portion of such latitude were allowed to them also. But it is far otherwise. Even under the more favorable circumstances of country life, they are too much restricted from the free exercise which health requires. Their very dress unfits them from taking it, and the alleged indecorum of those active movements to which youth and spirits instinctively incite, is a bar to even the attempt being made. At their age the measured, slow-paced, daily walk is quite insufficient even for the muscles specially engaged, while it leaves many others wholly unexercised. If this be true of the more hale and robust inhabitants of the country, how much more forcibly does it apply to the delicate and attenuated residents of towns, and especially to the inmates of female schools. Of these establishments the system and habits require much revision, and until some effective reformation takes place, of which there is yet but little prospect, they will not fail to excite our sympathy and regret for the blanched aspects, shadowy forms, and sickly constitutions so continually presented, and which it is so painful to witness. Such beings are as little fitted for encountering the toils or fulfilling the duties of life, as are plants of a hot-house for being transferred to the open yard.

51. **Daily Yard Life in a Boarding-School.** The amount of exercise, or rather the extent to which the *want of exercise* is carried, in many boarding-schools, will appear incredible to those who have not personally investigated the subject. The following *carte* may be taken as a fair example of the daily life in a fashionable boarding-school :

From 7 to 8, preparing for breakfast.
" 8 to 9, breakfast.
" 9 to 1, at various tasks in school.
" 1 to 2, preparing for dinner.
" 2 to 3, dinner.
" 3 to 5, in school.
" 5 to 6, preparing to go out.
" 6 to 7, walking, generally arm in arm.
" 7 to 8, tea.

Two days in the week they do not walk at all, being kept in for *dancing;* but by way of amends, they go out on two other days from 12 to 1, and then they miss *writing* or *music.* It is to be remarked that they never go out unless the weather is quite fine at the special hour allotted for walking. They go to church every Sunday, on which day no other exercise is taken.

From 8 to 10, reading or studying in school.
At 10, to bed.

The twenty-four hours are, therefore, thus disposed of:

In bed	9	hours.
In school at studies or tasks	8	"
In school or in the house	3	"
At meals	3	"
Exercise in the open air	1	"
	24	hours.

That the practical results of such an astounding regimen are by no means overdrawn, is sufficiently evinced by the following fact, a fact which we will venture to say may be verified by inspection of thousands of boarding-schools in this country. "The inspection of a large boarding-school containing forty girls, showed on close and accurate inquiry, that there was not *one* of the girls who had been at the school two years (and the majority has been as long) that was not more or less *crooked!* All the girls were pallid, sallow, and listless, and it is safe to assert that scarcely a single girl that has been at a fashionable boarding-school for two or three years, returns home with unimpaired health; and for the truth of this assertion we may appeal to every candid *father* or *mother* whose daughters have been placed in this situation." Happily, a portion of the ill-health produced at school is in many cases only temporary, and vanishes after being placed under more favorable conditions.

In the schools in which the vacations are frequent or long, much mischief is often warded off by the periodical returns of the ordinary habits of healthful life; and some happy constitutions unquestionably bid defiance to the systematic efforts made to undermine them. No further proof is needed of the enormous evil produced by the present system of school discipline than the fact, well known to most medical men, that the greater proportion of women in the middle and upper ranks of life do not enjoy even a *moderate* share of health ; and persons not of the medical profession, may have sufficient evidence of the truth, by comparing the relative powers of the young men and young women of any family in taking bodily exercise, more particularly in *walking*, the difference is altogether inexplicable on the ground of sex only.

52. The Evil Effects of Attempting to Produce a Good Carriage. It is an error to attempt to restrain the free motions of the body and limbs, so natural in early life. The young lady at school is expected to cultivate manners, to practice a certain demureness supposed to be becoming, to attend to her carriage, keeping her head erect, and her shoulders drawn back ; and if from inability to continue the muscular efforts necessary for this end, she fail to do what nature does not empower her to accomplish, negligence or obstinacy is imputed, reproach is cast, which being felt as unjust, irritates the moral feelings, and a slight error in physical dicipline becomes a source of bodily injury.

It is a well established fact with respect to muscular energy, that the contractions of muscular fibres on which their action depends, require intervals of relaxation; that if the contractions be prolonged without this relief, they in a certain time fail, so that no effort of the will can continue them. In other words the muscles tire, and an interval of repose is necessary to fit them for renewed effort. This is familiarly instanced by the experiment of holding the arm extended, when, even though no weight be held in the hand, the continued muscular action required for maintaining this position cannot be sustained for many minutes. If this be true of the firm and robust muscles of adults, how much more forcibly does the principle apply to the tender and immature muscles of early life.

To preserve a good carriage, to keep the head and shoulders continually in that position which the dancing master approves, require considerable muscular powers, such as no girl can exercise without long, painful and injurious training, unless other measures to be hereafter noticed be resorted to in aid of her direct endeavors. I would not here be understood as undervaluing a good carriage, which is not only pleasing to the eye, but is, when natural, absolutely conducive itself to health, as resulting from that relative position of the several parts connected exteriorly with the chest, which allows great freedom to the internal organs. But to ensure a good carriage, the only rational way is to give the necessary power, especially in the muscles chiefly concerned ; and this is to be done not by wearying those muscles by continual and unrelieved exertion, but by invigorating the frame generally, and more especially by strengthening the particular muscles through varied exercise alternated with due repose.

Direct endeavors to enforce what is called a good carriage necessarily fail of their effect, and instead of strengthening they enfeeble the muscular powers necessary for maintaining it. This fact soon becomes perceptible ; weakness is noticed, and instead of correcting this by the only rational mode, that of invigorating the weakened muscles, mechanical aid is called in to support them, and laced waistcoats are resorted to. These undoubtedly give support—nay, they may be so used as almost wholly to supercede the muscular efforts, with the advantage of not tiring, however long or continuously employed. Improvement of carriage is manifested, the child is sensible of relief from a painful exertion, the mother is pleased with the success of her management, and this success appears to superficial observation fully to confirm the judgment which superintends it.

In the present ignorance that prevails on all points of animal physiology, it would be quite impossible to convince any mother so impressed that she was doing otherwise than ministering to her child's welfare. Yet what are the consequences to which her measures tend, and which such measures are daily and hourly producing? The muscles of the back and chest, restrained in their natural and healthful exercise by the waistcoats called in to aid them, and more signally in after-life by tightly laced stays or corsets, become attenuated, and still further enfeebled, until at length they are wholly dependent on the mechanical aid, being quite incapable of dispensing with it for any length of time.

53. Laced Waistcoats. At first, laced waistcoats are used rather for the convenience of suspending other parts of the dress than with any view of giving support to weak muscles, or of influencing the shape; and confined to such use they would be perfectly harmless. In time, when weakness becomes inferred, not from any evidence of actual debility, but merely from the girls not being able to maintain the unnatural and constrained posture which fashion and false taste enjoin, the advantage of compressing the chest by means of the waistcoat, so as to give support to the muscles of the back, becomes discovered, and the mechanical power supplied by the lace affords but too effective means of accomplishing this compression. The effect pleases the mother, promoting, as it does, her dearly-prized object—a good carriage; it is endured by the girl as the lesser of two evils, for though at first irksome, it releases her from importunities to hold herself erect, and from the pain consequent upon such endeavors.

54. Operation and Evil Effects of Corsets. As years advance, various causes combine to render this practice more inveterate and more pernicious; and still the potent instrument, the lace, lends its ready and effectual aid. Now a taper waist becomes an object of ambition, and the stays are to be laced more closely. This is still done gradually, and, at first, imperceptibly to the parties. The effect, however, though slow, is sure, and the powers of endurance thus exercised come in time to bear almost unconsciously what, if suddenly or quickly attempted, no heroism could possibly sustain.

The derangements to which this increased pressure gives rise must now be considered. The first is the obvious impediment to the motions of the ribs which this constriction of the chest occasions. For perfect respiration, these motions of the chest should be free and unrestrained. In proportion as respiration is impeded, is the blood imperfectly vitalized, and in the same ratio are the nutrient and other functions dependent on the blood inadequately performed. Here then is one source of debility which effects the whole body, reducing every organ and part below the standard of healthful vigor. According, also, as each inspiration of air becomes less full, the wants of the system require, as a compensation, increased frequency; and thus quickened respiration commences, disturbing the lungs, and creating in them a tendency to inflammatory action. The heart, too, becomes excited, the pulse accelerated, and palpitation is in time superadded. All these effects are capable of resulting from mere constriction of the chest; they become fearfully aggravated when at a more advanced stage, additional sources of irritation arise in flexure of the spine, and in derangements of the stomach, liver and other organs subservient to digestion.

55. A Russian View of Tight Lacing. Dr. Boris I. Kianovsky has recently carried out a series of experiments in Prof. V. A. Manassein's clinic with the view of ascertaining the influence of tight lacing on the vital capacity, the movements of the thorax, the energy of inspiration and expiration, arterial tension, pulse and respiration. The experiments were made on 30 female patients, between 18 and 44 years of age, of whom 28 were more or less inveterate tight lacers (8

of them since the 11 or 12 year). The following is a summary of the result:

1. The corset lessens respiratory movement of the thorax, and diminishes the vital capacity as well as the force of the inspirations and expirations, the inspiratory movements being particularly affected.

2. The thorax being compressed and the amount of the inspired air being diminished, the corset necessarily gives rise to chronic "oxygen starvation," which is one of the essential causes of dyspnea and cardiac palpitation on brisk walking, fatigue being soon felt on physical or mental exertion, loss of appetite, faintness, and other kindred symptoms, such as are usually associated with tight lacing.

3. The arterial tension falls on putting on a tight corset, and in habitual tight-lacers it is generally below the normal standard, in "consequence of arterial anemia."

4. The effect of stays on the frequency of the pulse and respiration is well shown by the following experiments:

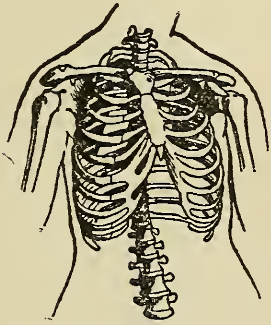
The women were made to run a distance of 980 feet with moderate swiftness without corset and light-laced, all other conditions being identical. After a run without corset the pulse was found to be 136, 140, and 156, and the respiration 32 per minute. In the same women tight laced the pulse was found to be 144, 160, 176, and the respiration 48, 60, 64, per minute. Among 38 wearers of stays, movable kidney was present in eight, habitual constipation or gastro-intestinal catarrh in 14, disease of the apex of the lung in six, anemia in five, hysteria in five.

Dr. Kianovsky gives a fairly exhaustive review of the work done on the same subject by Lesshaft, Hytle, Bouchut, Meyer, Hacker, Rotter, V. A. Manassein, Marchand, W. J. Collins, Arini, Graily Hewitt, Heyers, Helene Betts, Neftel, Schreiber, Mays, and others, and winds up his paper with the following words: "I cannot help stating in conclusion, that I look back both at the work of my predecessors and my own humble contribution with nothing but a sense of bitter and painful regret, for I am conscious that all those labors directed to prove the deplorable effects of tight-lacing will yet remain unnoticed or neglected for a very long time." What else, we may add, can be expected when even lady doctors whose business it is to know the right way in this matter, who, we presume, try to induce their patients to walk therein, in their own fair persons (it is whispered) do not always practice what they preach.

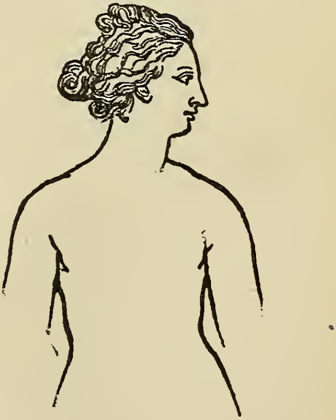
56. How Men Regard Tight Lacing. There would be no tight lacing if girls could be made to understand this simple fact: That men dread the thought of marrying a woman who is subject to fits, of irritable temper, to bad headaches, and other ailments, all of which, are the direct and inevitable products of the compression of the waist; men like to see a small waist, certainly; but there is a great difference between the waist that is well formed and in proportion to the rest of the figure, and a waist which is obviously and artificially compressed, to the destruction of that easy and graceful carriage which is one of the chief charms of a woman's appearance. An unnaturally compressed waist is far more certain of detection than a mass of false hair or a faint dusting of powder. The rawest youth that enters a ball-room can pick out the women who have straitened themselves artificially.

Ladies should learn that what they want is a gentle and pleasant support, encircling the waist with neat and accurate fit, and doing no injustice to the vital organs. They should no longer try to take on the model of an hour-glass as the pattern for personal figure. They should learn at the earliest possible moment that the organs enclosed in the ribs must be allowed a chance for free motion, if health is to be preserved. If a young woman, to obtain the appearance of a dragon-fly, has been subjecting herself to considerable physical pain, and who has been laying up for herself a pretty store of ailments which only want time to pronounce themselves, could only see the stare of scarcely disguised contempt and understand the scornful pity which greets the result of her labor, we should have a change of fashion. Through all changes women remain true only to one fashion; whether her clothing is as long and lank as that of a Grecian Virgin, or whether she builds around the lower half of her figure, a rotund and capacious structure of steel, she is ever faithful to the tradition of a small waist; and she will weaken her circulation, she will incur headache, she will crack her voice, and she will ruin her digestion, all to produce a malformation which wise men regard with pity and fools with derision.

57. Diagrams Showing the Effects of Tight Lacing. The following figures, taken from a valuable work in German, by Prof. Soemmering, on the effects of stays, cannot fail to make an impression on the mind of every sensible woman.



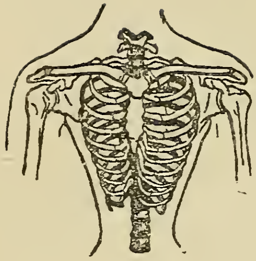
(Fig. 2.)



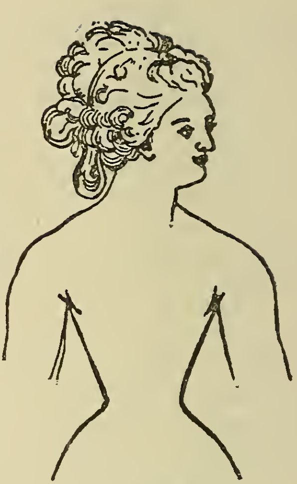
(Fig. 1.)

Fig. 1 is an outline of the famous statue of the Venus de Medici, and may be considered as the *beau ideal* of a fine female figure.

Fig. 2 is the skeleton of a similar figure, with the bones in their natural position.



(Fig. 4.)



(Fig. 3.)

Fig. 3 is the outline of a modern young lady, after it has been permanently remodelled by stays.

Fig. 4 is the skeleton belonging to such a figure as No. 3.

There is no exaggeration in these outlines. Such melancholy specimens are daily to be met with, both living and dead.

58. Union Almshouses. In a special report on "The Public Charities, &c., of the State," made to His Excellency Governor Carroll, in 1877, and again in the Third Biennial Report of the State Board of Health, 1880, I strongly urged the superior advantages of Union or District Almshouses, admitting of classification of inmates, hospital treatment, industrial pursuits and economy of expense. I have continued in almost every succeeding report to urge this scheme in behalf of the aged poor, the sick poor, the insane, the idiotic, the blind, and indeed all who by reason of misfortune are a "rent charge" upon the community.

No one can visit our almshouses, in their present forlorn condition, without wishing to do something to add to the well being and happiness of the lowly inmates, who, if not physically starving, are mentally starving. With willing minds and willing hands, they are ever anxiously longing for something to do; something to think of, instead of treading day by day the narrowed path of life that the poor and aged too often have to tread, helplessly and needlessly uncared for; nothing to do but think, and think, and think of the ragged remnant of their broken lives.

In the case of an overworked mind or body, idleness comes as a refreshing and recuperative rest; but in the case of many an old man or woman, accustomed to an active life until old age or poverty have come along, it induces a condition at once dull, deadening, and demoralizing. Into the "idle rooms" of almshouses are relegated the crippled, blind, infirm, and imbecile, whose age or infirmities exempt them from taking part in any work. Where mind and strength remain—as they do in some cases to the last extent—such a life is provocative of madness, and hence our almshouses are often nurseries of insanity or imbecility.

59. The Brabazon Scheme of Employment. It is not long ago that an old man in an English almshouse (workhouse as it is there called), friendless and tired of life, committed suicide, for apparently no other reason than that of being thoroughly wretched and having nothing to do. The opinion was then expressed by those who were best able to form an opinion on the matter, had he been occupied from day to day on some light and congenial work, instead of living his life of enforced idleness, he would not have destroyed himself. After this the necessity of giving light employment to the old inmates was discussed by the Board of Guardians of the Poor, and it was unanimously resolved that a committee of ladies should be appointed to give the inmates "something to do."

To Lady Brabazon, now the Countess of Meath, must be credited the happy idea of founding the work. She gave £30 ($150) for the first supply of materials to start the Kensington Union and keep the old people employed. The seed thus sown has taken strong root, and the result has been so marvelously striking and successful, that the scheme is not only likely to become a permanent one, but has spread to the formation of other Unions throughout the country. Old people who had been morose and sullen, have become bright and cheerful since they have had "something to do," and to the gallant band of ladies who formed the first committee, and who visit the house every week to carry on the scheme, the thanks of every one are justly due.

60. "The Idle Room." A most interesting pamphlet has been published from the pen of Miss Medhurst, the Honorary Secretary of the Brabazon Pauper Employment Scheme, on "The Idle Room," which is all the more interesting and instructive from the fact of the authoress having had such practical experience with the working of the Kensington and Paddington Unions, where the scheme was first introduced. Several of these pamphlets, and other literature on the subject were kindly furnished me by Lady Meath; but however interesting the facts dilated upon were in print or to listen to, there is an additional novelty in seeing things for oneself, and hence it was that, during my last visit to England, I betook myself to the Union to see for myself how the scheme worked, and whether it was such an unmixed blessing it was held to be. I went, I saw, and was so surprisingly struck with my visit that it will not be out of place to give a somewhat detailed description of what I saw, in order, as far as possible, to familiarize our authorities and the people of the State generally with a noble work so happily introduced by a noble woman.

61. A Model Almshouse. The Union almshouse visited is under the charge of a master and a matron, who by experience, ability, and intelligence, are admirably fitted for such important posts. The buildings are roomy, cheerful and beautifully clean, and they stand in a piece of ground some little distance from the main roadway, which is surrounded by and overlooks

a lovely stretch of Kentish landscape. Flower gardens, either circular or bordering the pathways, were filled with sweet-smelling and gaily colored flowers, and vegetable gardens were equally well stocked ; a green sea of tender undergrowth waved in front, and towards the left, far away over miles of hills and dales, can be seen bright chalk cliffs, which stand out in marked relief amid their emerald surroundings.

62. Cheerful Diligence. Their minds being now interested, they have an object in view, and they work with diligence and cheerfulness, which materially adds to their mental and physical comfort. Striking testimony is given of their improved condition under this system, for whilst, in answer to inquiries, the old men complained they could not get to sleep at night when they had nothing to do, they now say they can sleep splendidly. It is a happy and a blessed work, for instead of bickering and quarreling they cheerfully do their simple work, and enjoy refreshing sleep. And very pretty, useful work they do. Here is one old lady, who has passed her ninetieth year, calmly engaged on a woollen mat, neatly and strongly made. She spreads it out on the coverlid with silent pride, and listens with a glistening eye to the cherry praise of the visitor or matron who closely examines and admires her handiwork.

63. Lone-Lorn Creatures. Entering the building devoted to the aged and infirm, a curious spectacle meets the eye. Little white beds run along each side of the women's ward. Their occupants are indeed "aged and infirm," for the old ladies, all wearing snowy caps, vary in age from 60 to 90. Some of them are keen-eyed, complacent old souls, whilst others are lone-lorn creatures ; some are feeble and prostrate with infirmity, but others, with all their yellow and withered faces, look as keen and as active-minded as ever. Theirs is the "quick" life tied to the "dead" form—their minds clear and active, and their frail frames sinking under many ills which flesh is heir to. These are the forlorn creatures "who," to quote Miss Medhurst's pamphlet, "The Idle Room," "used to spend their days sitting and waiting for meals, uneasily dozing or basking in the sun-light, sinking into an apathetic condition of non-resistance to their fate, more pitiful than any eloquent appeal could be—passively surveying their dull, drear lives. But, thank God, a gleam of light has now penetrated into their lives, by the philanthropic efforts of the promoters of the Brabazon scheme, for this with other wards, is now transformed into a centre of simple, healthful occupation."

64. Teaching the Old Idea How to Shoot. Another old lady has a table close to her bedside, on which are placed a number of flower-pots, some of them filled with geraniums raised by herself, and others filled with orange and lemon plants, raised from seed, which she doubtless planted with great care. Others were making pretty colored pon-pon balls, whilst crochet, knitting, and simple needlework occupied the attention of others. Of course, in many instances, the ladies engaged in the scheme find it necessary to instruct their "pupils" how to work—"teaching the *old* idea how to shoot" in fact—lessons being given with great kindness and patience; but once taught, it is astonishing with what quickness and aptitude they perform their allotted tasks, if such they may be called. Nothing but pleasure and zeal can convert them into such "good hands." Some of the workers are quite blind, but some excellent work is often done by those who are thus afflicted. Of course the work is voluntary, but nearly all prefer to do something or other. Cheering words, and the knowledge of "something attempted, something done," being sufficient reward for their skill and industry. There sat one old lady in the corner, apparently long past work. Her age is unknown, but she thinks she is "about 98;" at any rate her youngest son is 67! The pleasant-eyed old granny watchfully waits for the approach of the matron, and as she greets her familiarly with a pleasant salutation, and asks, "How her baby is?" one is highly amused to see her tenderly lift from under the bed-clothes, a small doll, dressed in most approved fashion. In second childhood she has become greatly attached to her juvenile plaything, and says with maternal pride, "It is a great comfort to me, it is."

65. How the Old Men are Employed. The occupants in this ward are engaged in the making of toys, nets, mats, ornaments, baskets, brackets, made out of cigar boxes, and other trifling articles, both useful and ornamental. One old fellow takes a great pride in scrap-book making—he turns out one a week on an average—and very neatly and nicely he performs his task. Now he yearns for illustrated papers, and all kinds of scraps, all of which he clips out and fits in with striking neatness and taste.

66. Other Sources of Pleasure. The inmates find pleasure in the music of a harmonium, the kind gift of a lady. They often form groups and sing little hymns, after their day's work is over. This is a feature with which the old folks are much pleased.

67. General Particulars. In the way of general particulars, it should be stated that the medical officer, as well as other gentlemen, were skeptical as to the result of the scheme, but they have since expressed their gratification at its great success, the Doctor stating that it has put new life into them. There is already a large quantity of work finished, which will be sold at a bazar to be held at the end of the year, from which enough is realized to pay the ordinary expenses of the Union.

68. Good Work by the Countess of Meath. The Countess of Meath, to whom I am indebted for valuable information and kind courtesies, writes as follows:

"Some few years ago, struck by the evils of the idle existence of the aged almshouse inmates, I sought to find a remedy by offering a fixed sum, not exceeding £30, to any workhouse where the money could be laid out in the purchase of materials to be worked up by the patients, and then sold at a profit for the purchase of fresh wool, cotton, twine, etc., and also to give small rewards to the workers. The proposal was brought to the notice of a good many poor law guardians, and amongst others to that of Miss Donkin, an energetic lady guardian at Kensington Workhouse, who undertook to bring the matter before the Board, which happily was composed of those who had the pauper's welfare at heart. Consent was obtained for the scheme to be tried, a committee of ladies was formed to carry it out, and an excellent hon. sec., Miss Eyre, appointed.

The scheme has proved—as it was intended to be—quite self-supporting, and at Kensington, where it has been for some years steadily at work, the committee have always found themselves in a position to give rewards to the workers. These rewards take many and various forms. One woman may receive a book or workbox, a man with a taste for flowers may be the happy recipient of a growing plant, another is given bath-chair drives, others who are likely hereafter to leave the workhouse have a store of small coins laid by for them, to be ready when the owners are well enough to bid adieu to the infirmary. A great advantage which has arisen from this scheme being established is that a man or woman in more than one instance has been taught an employment which has proved of great service in helping him or her to gain a livelihood on leaving the institution. Some excellent wood-carving has been done in the Kensington Workhouse, and artistic talents have been discovered hitherto unknown to the workers. A lady who has taken deep interest in this scheme gives the following list of some of those whom she saw employed :

I. An old verger doing beautiful needlework, able to *sketch* as well as to *stitch* his patterns.

II. A sailor half paralysed by the effects of a sunstroke.

III. North-country laborer.

IV. Man, seventy-eight years of age, working most industriously at a large quilt, crippled and infirm.

V. Crippled with chronic rheumatism, knitting on a frame with one hand only.

VI. Blind girl, thankful to knit all day.

VII. Invalid confined to bed able to do fretwork.

"This list might be largely added to, but it seems unnecessary, for we trust that enough has been said to prove that it is possible to employ most infirm persons, that employment is very grateful to them, and that they are mentally and physically benefited by it. In one institution the workers said that since they had been occupied they were able to sleep better at night.

"The scheme is now at work in the following workhouses : Kensington, Fulham, Paddington, Kingston-on-Thames, St. Pancras, Sevenoaks, Tonbridge."

PART IV.

BUSINESS OF THE SECRETARY'S OFFICE.

69. The Current Business of this Office has more than doubled during the last two years, principally crowded into a period extending from the 1st of April to the 1st of November. At other times the business of the office is very light, and the Secretary devotes this period to investigations in the field of sanitary science, both at home and abroad; to the preparation of reports, circulars, &c.

The increased sickness throughout the State during the last spring, summer and autumn, caused by excessive rains and unprecedented floods, greatly increased the labors of the Secretary, both in the way of making personal visits and inspections, and by answering inquiries from health officers of local boards, municipal and county authorities and private individuals, as to what to do, and how to do it. It is scarcely credible, the number of inquiries which come from the small towns and rural districts relative to sanitary matters. The local health officers in many instances do not seem to comprehend the scope of their duties, and their authority is too often gainsaid or denied. This involves constant inquiries being made at this office, all requiring long and detailed explanations, and frequently a personal visit. It is gratifying to report that the authority of the State Board has been very generally acquiesced in, and with a few exceptions its orders have been cheerfully obeyed by the people, who now recognize the fact that the health laws of the State are both reasonable and valuable. Heretofore, with the exception of a few corporate and municipal laws, no code of health laws or rules had existed. The public and many of the medical fraternity were lamentably ignorant and careless in regard to sanitation; but in proportion as sanitary laws are studied and comprehended they become appreciated. Those laws, founded on the accumulation of wisdom and observation, are right; and as right and truth progressively prevail, with a higher order of intelligence, so will the rules and regulations of the State Board of Health become acceptable to the masses.

When this Board was first organized there were doubts in the minds of many as to its necessity, and for a time much prejudice existed in some communities against its work, so much so, that in more than one instance the Secretary was threatened with violence if he should attempt to execute the law. These doubts and prejudices, however, have gradually given way, as the Board has fearlessly, but with prudence, gone forward in the discharge of the work before it, until there is now an almost universal conviction that its services in protecting the people from disease cannot well be dispensed with.

70. Quarterly Meetings. The quarterly meetings have been held with regularity, except in April, 1888, which meeting was postponed on account of the extreme illness of the Secretary. At each of these meetings comprehensive reports were submitted by the Secretary and approved by the Board. As these reports were for the most part published in the daily press of Baltimore at the time, it is deemed unnecessary to reproduce them, except the following, which were specially ordered to be published in the Biennial Report by the Board, as of special interest to the public.

REPORT
OF
DR. C. W. CHANCELLOR, SECRETARY AND EXECUTIVE OFFICER
STATE BOARD OF HEALTH,

For the Quarter Ending September, 1888.

71. Sanitary Condition of the State. Maryland is growing year by year more and more healthy. Compared with other States her sanitary condition is exceptionally good; but, because we are comparatively exempt from disease, we must not hold ourselves absolved from further efforts to improve our condition. We have already accomplished a great deal that at first seemed unattainable, and if we would not fall short of what it is our positive duty to accomplish, we must always be striving after perfection, even if we have, as at present, to pursue the desired object under great difficulties, for lack of funds and the necessary statistical data. I have sufficient confidence in the wisdom of our legislators to believe that they will ere long give more attention to the all important question of sanitation, and see to it that the State Board of Health shall not in the future lack the necessary means to secure for this State the proud distinction of being the Hygieopolis of America.

The enemies which we combat are disease and premature death, with the waste of energy and of material resources which they involve. The figures of the death-rate in various localities, as affected by altered circumstances, are the great test to which we appeal, both as proof how much has been done and how much still remains to be done where those methods have been either neglected or misapplied. To calculate accurately death-rates of any kind, two sets of data are indispensable, namely, the number of the living and the number of deaths occurring among them.

Our present system of voluntary correspondents is quite unsatisfactory for sanitary statistics, but reports received from about one hundred and fifty such correspondents, throughout all parts of the State, during the last two months, indicate an unusually limited amount of sickness during the months of July and August, the most prevalent sickness being paludal fevers, dysentery and diarrhœal diseases—principally cholera infantum. These diseases have been more or less influenced by sudden alternations of heat and cold, but decomposing organic matter and unsuitable food may be also reckoned as prominent factors.

The outbreak of malarial fever of a typhoidal type at the Industrial School for Colored Children, at Melvale, in Baltimore county, and the prevalence of measles and whooping cough in several localities, have been the only approaches to an epidemic prevalence of disease. The fever at Melvale was promptly investigated by the State Board of Health, and the cause of its existence being satisfactorily determined and promptly removed, a threatened epidemic was averted. The disease is now quite under control, no new cases having occurred for several weeks.

Typhoid fever continues the opprobrium of some of our villages, though it has been less prevalent than usual during the last quarter. Every death from typhoid fever is a homicide. The disease can and should be prevented. Among its prominent causes impure water stands by far the most prominent. Cistern water is likely to be contaminated by impurities in the atmosphere, and on the roof; surface water, or the water of shallow wells, is likely to be contaminated by privies, cesspools, graveyards, stables, pig-pens, &c., and subterranean water depends for its purity on the purity of the soil through which it percolates. Whatever the source of supply, all drinking water should be boiled, unless it is positively above suspicion. Filtering may not destroy the germs of disease—boiling the water will do so absolutely.

Diphtheria has also prevailed to a limited extent in the city and in some of the counties. The contagious nature of this disease ought to insure prompt disinfection of every article used by the sick, and strict isolation should be enforced in every case. There is no doubt that diphtheria is frequently propagated by permitting mild cases of the disease to mingle with the public, it not being generally known, that from the mildest attack the most virulent cases can be and often are developed. The disease is also not unfrequently propagated by noxious emanations from any source. The strictest hygienic measures should, therefore, be enforced within our towns, our dwellings, and their surroundings. It is axiomatic that communities can only succeed in rendering themselves secure against this disease by sanitary forethought and precaution. All garbage and household wastes should be quickly disposed of in a manner not to give offence. Cesspool privies, "the deadly upas" of our cities and towns, should not be tolerated anywhere or under any circumstances, and other privies should be frequently cleansed and disinfected. Filthy slaughter-houses, rendering establishments, badly kept stables, pig-pens, &c., should be uncompromisingly banished without the limits of every town and village.

72. Malarial Fevers. The Eastern Shore counties of Maryland have long rested under the unjust and damaging reproach of being more subject to malarial fevers than the counties west of Chesapeake Bay. Of course the question of the relative health of different sections of the State cannot be accurately determined until we have a comprehensive system of collecting vital and mortuary statistics ; but personal observation, coupled with the data furnished by local health officers and correspondents throughout the State, would seem to indicate that, whatever the condition of the Eastern Shore may have been in former years, as regards health, it is now more exempt from disease than any other part of the State, and especially is this true with respect to malarial fevers and pulmonary consumption.

It has been demonstrated that infectious diseases have their origin in putrefactive processes, while certain miasmatic diseases exist where organic matters are constantly undergoing change, and in no case may we so surely reckon on their occurrence as when a marshy surface has been dried up by continued heat, or when extensive inundations are followed by intense heat. These diseases have recently been attributed by Klebs and Tommasi-Crudeli to a bacillus which occurs in the soil; but there is no final evidence indicating the real cause of the disease. There can be no doubt, however, that the miasms of marshes are matters which accompany or result from the process of decomposition, comprehended in the term "putrefacfaction;" but there seems to be a confusion in many minds between the salt water marshes or peat-bogs of the Eastern Shore, and the ordinary fresh water marshes or morasses, which abound in infusorial life, characteristic of stagnant water. The difference is very great. No peat-bog gives out marsh fevers and agues, although the dampness may induce rheumatism. The acid peat prevents decomposition, and so removes all the results of putrefaction, which is supposed to be the origin of the evil in marshes.

73. A New Remedy for Malaria. The ordinary lemon is a cheap, harmless and yet effective remedy for malaria. To prepare it for use make a decoction as follows: Cut up one lemon, peel and all, into thin slices, put these into a pint of water and boil down to one-third of a pint; strain through linen, squeezing thoroughly the remains of the boiled lemon and set aside to cool. Drink the whole when fasting. As the decoction possesses cathartic properties, the dose should not be repeated too frequently—not more than once a day, or every other day, according to the individual susceptibility. It is claimed that this remedy is especially efficacious in the chronic forms of malarial poisoning which are no longer relieved by quinine, and as it is cheap and innocuous, it should receive universal trial.

The Secretary of the State Board of Health would be glad to receive reports from those who may try the remedy, stating: 1st, The history of the case, its duration and previous treatment; 2d, The number of lemons used in each case, and 3d, The result in each case.

74. **The Eastern Shore of Maryland as a Sanitarium.** From the data obtained, which will be more particularly given in a future report, it is quite evident that the Eastern Shore of Maryland furnishes the grandest atmosphere for persons suffering from pulmonary affections to be found in this country; and, by timely seeking it, many sufferers may be permanently cured and others greatly relieved. Some writers deny that such good results can be attained except in elevated districts; but it must be admitted that these opinions have no reasonable foundation. We cannot discredit those witnesses who testify that Aiken, South Carolina, and Jacksonville, Florida, (now unhappily stricken with yellow-fever) have proved eminently beneficial to some consumptives; or that such places as the Kirghis Steppes, of Asia, enjoy complete immunity from consumption, although actually below the sea level.

Many localities on the Eastern Shore might be pointed out which offer attractions as a winter resort or all the-year-round home preferable to either South Carolina, Florida, or California, all of which lack the atmospheric tonicity of the Eastern Shore of Maryland, where the temperature is modified and rendered more uniform by large bodies of salt water, being warmer in the winter and cooler in the summer than is generally the case in the same latitude elsewhere.

The relation between soil-moisture and consumption was first pointed out by Dr. Bowditch, of Boston, in 1868, and subsequently verified by Dr. Buchanan, of England, whose investigations led to the general conclusion that the amount of consumption is in proportion to the dampness of the soil. The soil of the Eastern

Shore is composed for the most part of sand and loam, which greatly facilitates the natural drainage by allowing the surface water to rapidly percolate, so that even after a heavy fall of rain the ground rapidly dries—a feature of no little importance, as it contributes to the dryness of the soil and the surrounding air,—important desiderata in the alleviation of pulmonary diseases.

75. Mortality among Farmers, Laborers and Mechanics. It is not always in the cities that the most pressing need for improved sanitation exists. The water supplies in nine out of ten of our villages are liable to contain the germs of disease. If they do not it is because there are no infectious diseases around. In the farm houses and country dwellings the same unsanitary conditions prevail to a very great extent, and hence the great disparity in the death-rate among farmers as compared with all classes of the population engaged in other occupations. The United States census shows that of the 300,000 persons engaged in all occupations in this State, only about 25 per cent. of the number are occupied in agricultural pursuits, but of the 1600 deaths occurring among those of specified occupations, 44 per cent. are farmers, or persons engaged in agriculture ; 22 per cent. are laborers ; 16 per cent. are mechanics ; 10 per cent. are merchants and clerks ; 4 per cent. are factory operatives ; 2 per cent. are physicians ; 1½ per cent. are teachers ; 1 per cent. are lawyers, and ½ per cent. are clergymen.

It will be seen from the foregoing figures that the loss of life among the agriculturists of our State is exceptionally great and alarmingly out of proportion to that of any other specified class, and that the laborer and mechanic come next in the order named. Such a high death-rate among these three classes, among all others the most important to the material prosperity of the State, implies not only a waste of life, but a concurrent waste of time and energy, in consequence of the greater prevalence of non-mortal diseases which accompany it without fail. Nor is this all. Whether in sickness or in health the whole bodily machine is working at a lower power, and to diminish the death-rate is not only to save lives, but to add health and vigor to the survivors. With increased vitality there is less temptation than before to some forms of excess injurious to health. The working man will no longer need or fancy that he needs the stimulus of drink as the most ready cure for the dullness and depression of existence at half power. With good health he is a different man, and he feels himself a different man in body and in mind alike. He can do more work, and better work, with fewer intervals of enforced inaction. It is not only that he has prospect of a longer life, but that he enjoys a life worth living while it lasts. This it is which gives the figures of a death-rate their full significance in the view of the sanitary reformer, and which stamps as a crime against society the wilful neglect or breach of known sanitary laws.

76. Fraud in Food. Among the many food compounds which are industriously advertised and in other ways brought to the attention of the public, no one of them perhaps is more misleading than the so-called "food for the nutrition of infants," which generally has not a particle of advantage over ordinary baked cracker flour mixed with one-fourth its weight of milk and sugar, and is far from being suitable nourishment for tender infancy, critical sickness or the last lingering years of senility.

Reference was made in a previous report to the adulteration of milk and its disastrous effects upon infant life. I am now enabled to present additional information which may be of service in protecting the health of communities. It has been ascertained that it is not unusual for dealers to manufacture and sell a fluid so similar to milk in appearance and taste that it is said to defy detection except by chemical analysis. The "stuff" is made by skillfully combining water, chloride of sodium, white sugar, bicarbonate of soda and nitrate of potash, to which coloring matter and milk are added in a certain small proportion. The compound looks richer than ordinary milk, and is well calculated to deceive the unwary. True, it is fatal to infant life, but what does the dishonest dealer care for that? Again, it is not an uncommon occurrence that dealers in milk try to hide an incipient acidulous condition of the fluid by the addition of soda. This is particularly the case in the summer time, when the soda is sometimes added to fresh and normal milk, with a view of preventing its turning sour. Though the quantity of soda added is comparatively small, yet the practice is an improper one, since it is apt to effect injuriously the delicate mucous membrane of an infant's stomach.

77. **Public Laundries.** The establishment of public laundries for the accommodation of the poor is an important means of promoting the public health of any city, and deserves to be encouraged, if not supported, by the municipal government. The housing of the poor is not the serious question in Baltimore that it is in most large cities; but even in this city where, as a general thing, comfortable homes, having the necessary conveniences for cleanliness and domestic work, are provided in greater numbers than exist in other cities, there are many of the population who have to content themselves with accommodations of the most inferior kind. One or two rooms must suffice for the family. The washing of clothes, cooking and all other domestic work is performed in the apartments used for living and sleeping. Under these circumstances home comforts are banished, and health—the main dependence—is jeopardized. For such people the public laundry would be a great boon. The disagreeable operations of washing and drying clothes could be transferred from the dwelling and sleeping apartments to an establishment fitted up with every convenience to facilitate the work, to which the housewife of the poor man could have access a certain number of hours upon the payment, if necessary, of a few cents.

78. **Public Baths.** The public bath system admits of

a wide field of application. Swimming baths are not only promoters of cleanliness, but an excellent means of healthy exercise. In Germany public baths are probably more elaborate and complete than anywhere else, and are to be found in all the principal towns. The swimming bath at Cologne is one of the largest and most complete on the Continent of Europe, and is an illustration of the extensive patronage with which such establishments meet. The poor suffer not only in their health but in their morals from being deprived of the advantages of the bath; for, as a rule, a "dirty man is a dissolute man."

79. Healthy Kitchens. It is possible, nowadays, so to build a kitchen that the most ingenious of servants cannot keep it otherwise than clean. Glazed bricks, which are highly polished, will make the floor, the chimney, the walls, and even the ceiling, if desired, as easy to clean as a breakfast plate. Once built, no whitewasher and no painter would be needed for such a room, no smoke need cling to the walls for an instant, and no odor of cooking would adhere to the surfaces, even if the kitchen were used for generations. The temperature of such a room need not reach the great height unavoidable with plastered walls, which permit the warmth of the chimney to be perceptible through their surface, and thus both the good health and the good temper of the cook would be maintained.

80. Slaughter Houses in the City. Owing to the enlarging of the city limits, quite a number of slaughter houses have been added to those hitherto existing in the city. Some of these are properly built and kept in excellent condition; but the law does not prescribe any special way of constructing such establishments, nor does it authorize systematic inspections of them, consequently many of them continue to be discredit to this particular branch of industry and a source of nuisance to the community, their walls, floors and ceilings should be constructed of some hard material, as slate or glazed brick, that will not absorb and retain the septic poison om decayed blood and flesh, and communicate it to recently slaughtered meat, which being thus infected will produce toxic symptoms due to alkaloidal poisons (ptomaines), and prove the starting point of a specific disease, or some form of gastro-intestinal symptoms. The ingestion of any meat unfit for food, or derived from diseased animals, will produce the same effects. In the Kloten epidemic 717 persons were affected from eating the meat of diseased animals, and many deaths ensued. A similar result followed a banquet at Andelfingen, at which five to six hundred people were present. Four hundred and fifty of the number were made sick with a disease which was diagnosed to be typhoid fever. The bad taste of the meat was remarked by several of the *convives*.

81. **Diseases Conveyed by Animals.** The prevalence of diphtheria among human beings has been so significantly preceded, in a number of epidemics of the disease, by throat affections among domestic animals, that there is at least a strong probability that the infection may be communicated by those animals to persons who have come in contact with them. Dr. Turner, of the Local Government Board of England, finds grounds for believing that the sort of sore throat known as "strangles" in horses has some affinity with human diphtheria. Dr. Ogle, of Scotland, reports a case in which diphtheria occurred in a shepherd's family shortly after a throat disease had prevailed among the sheep. The Board of Health of Amsterdam investigated an outbreak of diphtheria from which two children died, and a third, who was attacked, recovered. The disease was traced to a pet kitten, with which the little girls played while the animal was sick with a swollen throat.

—. **Diseases Transmitted by Milk.** It has been known for some years that both typhoid fever and scarlet fever are frequently diffused by the agency of a contaminated milk supply; and, more recently, the same has come to be believed with regard to diphtheria. The active agent in the diffusion of typhoid fever is usually fouled water, which is used either for the purpose of diluting the milk, or for cleansing the cans or other utensils. At least one well marked epidemic of milk typhoid has been investigated and reported by the Secretary of this Board. There was proof or high probability that the disease was distributed with a milk supply derived from a dairy farm where several cases of typhoid had existed a short time previous to the outbreak of the epidemic. As soon as the consumption of the suspected milk ceased, the epidemic, as such, came to an end. In the case of scarlet fever and diphtheria there has never been any evidence to connect these diseases with contaminated water, but their *contagia* are known to have been present in great activity in milk. An instance of undoubted milk scarlet fever was reported in 1887, by Mr. Power, a Medical Inspector of the Local Government Board of England, who discovered that certain cows in a dairy at Hendon had been affected by a peculiar eruption about the udders, and by loss of hair in patches, only a short time before persons who drank the milk of these cows were stricken down by scarlet fever.

That the cow is liable to scarlet fever, and that the milk of the animals thus affected, either by its own properties or by admixture with secretions from the udder in the act of milking, becomes an ordinary means of the transmission of the disease, does not longer admit of a doubt. Whether the disease originates in the bovine race, or whether cows receive the infection in the first place from man, is an unsolved problem; but the fact remains that a disease in cows, which may easily be discovered if looked for, is calculated to communicate scarlet fever to those who partake of the uncooked milk of the affected animals. To prevent the spread of infectious diseases from cattle to man, every herd in the State should be examined from time to time by skilled Inspectors. The examination should extend also to the pastures, the stalls and the dairies.

Respectfully submitted,

C. W. Chancellor, M. D.,
Secretary and Executive Officer.

REPORT
OF
DR. C. W. CHANCELLOR, SECRETARY AND EXECUTIVE OFFICER
STATE BOARD OF HEALTH,

For the Quarter Ending July, 1889.

82. Causes of Disease. In order that local authorities and the people generally may undertake in an intelligent manner work which shall result in the decrease of preventable diseases, it is necessary that they comprehend something of the causes and processes by which these diseases originate and are propagated.

It is only within recent years that we have come to understand the process by which fermentation and putrefaction of dead organic matter, whether animal or vegetable, takes place, and produces a multiplication of living organisms of various species, causing changes in the chemical composition of these organic materials which give rise to virulent poisons, that produce serious disturbances and diseases in the human body, now classed as "Diseases Dependent on Morbid Poisons."

At this season of the year, with a high temperature, succeeding excessively wet weather, it is important to recognize the fact that malarial or paludal influences operate mostly in places where air, water and soil have become polluted with organic impurities, whether vegetable or animal. The most common sources of sanitary trouble in the State are to be looked for in the pig-pens, slaughter houses, privy-cesspools, burying grounds and polluted water supplies of the small towns which will be successively considered.

83. Pig-Pens. One of the principal things which makes a pig-pen a nuisance is the feeding of pigs on garbage or house offal. It would be very much better to convert such refuse into manure, than to store it in barrels or tubs about the house to feed the pigs with, and, incidentally, to produce disease.

But the chief cause of the nuisance of pig-keeping in towns is that the floor and adjacent soil are never kept clean. The straw or other litter in the pen holds together all the filth, which soon becomes a putrid mass, and continues to lie in the pen for an indefinite period, however foul it may be. The remedy for this is to pave the floor with asphalt or some material impervious to water; remove the accumulations at least once in twenty-four hours, and wash the floor thoroughly after each removal. But nothing can be done in this, nor in any other sanitary requirement, without an ample supply of water, and to secure this would, in most instances, require in money or time, twice the value of the pig.

When we consider that the pen is usually in the immediate neighborhood of dwelling houses, we see that families must necessarily be subjected to great annoyance where pigs are kept on adjoining premises, and especially so when these are fed on household wastes or the offal from a slaughter house. Notwithstanding it may be considered a harsh law which would prevent a poor person keeping a pig, when he believes it to be profitable to him, yet there are certain situations in which pigs ought not to be kept at all, viz.: (1.) Adjoining or near a dwelling house; for in such situation the windows cannot be opened without admitting the foul emanations of the pig-sty, however well it be kept. (2.) Immediately adjoining a public road, street or highway.

It is a frequent question asked by those who wish to conform to sanitary regulations, "At what distance from a dwelling house they may keep a pig?" This would seem to depend upon the state in which the sty is kept. If it should be kept in a filthy condition it should be, unhesitatingly, removed, at least one mile beyond the town limits; if the floor be such that the filth can be easily removed from it, and if a sufficient supply of water be at hand, and the sty be kept in such a condition as not to be a nuisance, the minimum distance, which should be insisted on in all such cases, is one hundred and fifty feet from any dwelling house, and fifty feet from any public highway or street, and then the solid and liquid filth should be removed and buried at least once in every twenty-four hours, in order to prevent the formation of injurious gases, or at least to lessen the quantity.

The paramount necessity of cleanliness and dryness in and about a pig-pen cannot be too frequently reiterated. The floor should be swept and washed clean every day, and subsequently sprinkled with fresh sawdust. There is no better absorbent, no cleaner material than this, and it is both cheap and easily obtained. The pen should also be frequently limewashed.

84. **Privies and Cesspools.** An open privy-cesspool is in most cases a nuisance. The addition of small quantities of water to effete organic matter causes fermentation and the liberation of the gases of decomposition. Either an abundance of water to wash the matter away through some sewer, or water should be wholly excluded. Where there are no excretal sewers the cover of a privy pit should be so made as wholly to exclude rain water. In most cases the ground is more or less porous, and the water sinks into it and carries with it in solution the contaminating matter of the cesspool, perhaps into a well of drinking water two, three, or even five hundred feet distant. At best the case offers but a choice of two evils : either the water is evaporated, carrying into the air the noxious gases (and, perhaps, the germs of specific diseases), or it contaminates the underground water. All privy pits, therefore, should be water-tight.

In devising means to an end, it often happens that the object assumes a form different from that first conceived, although it may remain the same in principle ; the one form growing out of the considerations given to the other. Thus, as soon as reason has established the case that there should be no open cesspools, but that they should be converted into water-tight cesspits, a little further consideration shows that when everything is water-tight and dry, no pit at all is necessary. In considering how to prevent exhalations from an open cesspool, the first thing that occurs to one is to cover it; the next to supplement the close cover with water-tight walls and bottoms; and in order to absorb the liquid and hold it for manure, a quantity of dried earth or ashes is thrown into it. But when the contents of the cesspit are thus changed from a liquid to a dry mass, there appears no reason for a pit at all, and no reason why the mass should not be deposited in tight boxes or tubs, or even on the level of the ground, so as to be easily carted away, and avoid the useless labor of digging it out of a pit. Besides the greater facility of emptying, this plan has the advantage of being rather less expensive than the pit.

There is another method which consists in laying a concrete or other flooring at the ground level to receive the deposit, around the edges of which on three sides the house ashes are arranged. The floor of the privy in this case is raised above the level of the ground—say two feet. The excrement and the ashes are mixed together when required to be removed. If the ashes are carefully disposed around the edges of the excrement floor, they absorb the excess of liquid and prevent its spreading over the surface of the ground outside. This method would of course be objectionable, unless the floor and the space occupied by the ashes were roofed over. That being done it would be preferable to a pit. Indeed, any kind of a pit is to be avoided if possible. The open pit ought not to be allowed under any circumstances, and seeing the difficulty of making a pit water-tight, it is advisable to have none at all.

85. Burying Places in or Near the Town. The eyes of the public should be opened to the dangerous results arising from the practice of interring the dead in immediate proximity to the living. It cannot be denied that to bury the dead in or near a town is a serious

evil, and one which has been a subject of sanitary regulation from the earliest times. The ceremonies of the Jews, the process of embalming practiced by the Egyptians, the burning of the dead by the Greeks, the Romans and the Ethiopians, were but sanitary measures to escape the dangers that arise from the process of putrefaction. The Jews dreaded all communication with dead bodies, so much so that travelers were even forbidden to walk near the places where the dead had been interred ; and among the Greeks the practice of conveying the dead far beyond the walls of their cities, as soon as life was extinct, was sustained both by the laws and by the religious doctrines of that refined people. Among the Romans the prohibition of inhumation in towns was fully established in the law of the Twelve Tables.

We find also that the Parliament of Paris in 1765 took a stand against the abuses of the then existing system of interment. In the preamble to their decree on the subject, it was asserted that "daily complaints are made on the infectious effects of the parish cemeteries, especially when the heats of summer have increased the exhalations." It was not, however, until 1790 that a law was passed by the National Assembly, commanding all towns and villages in France to discontinue the use of their old burial places, and to form others at a distance from their habitations. Not only has the French Government, but most of the governments of Europe have of late years given pre-eminent attention to this matter, and in many instances the remains of those who had long laid mouldering in their tombs have been carefully removed from the interior of cities, and tenderly deposited in mortuaries so far distant from the "busy hum of man" as not to endanger the living. Not only should all burying places be remote from habitations, but the mode of burial should be regulated by law. Graves should never be so close to each other as to prevent the access of air through the porous soil to the body, and the earth, even of remote cemeteries, should not be permitted to become saturated with the putrescent exhalations which are characteristic of old and crowded burial places.

Both State and municipal laws should require that dead bodies be buried at such a distance from human habitations, that the putrefactive process of the grave may not exercise its baneful effects upon the living.

86. Health Resorts of the State. Regarding the subject of sanitary improvements at resorts, I am glad to report that at Deer Park, the Oakland Hotel and Blue Mountain House the most approved sanitary arrangements have been introduced, and the public may visit these places with a feeling of perfect security against the dangers of sewer gas or bad water. Easton and Salisbury are contemplating the construction of large modern hotels for the accommodation of winter guests. These places are taking on New Life, and there can be no reason why their hotels, if properly constructed and conducted, should not be filled with guests nine months in the year. The convenient locations and superb climatic advantages of these towns will give them the wide-spread fame they merit, if their sanitary administration is well conducted and looked after each year. Easton may be regarded as the pioneer town of the State in this respect. The streets are well shelled, and all highways and premises are kept clean; the water supply, drawn from artesian wells, is exceptionally pure and abundant; cesspools have been interdicted, and all pig-pens and slaughter houses have been removed to a safe distance from the town. With the same enlightened care Hagerstown, with its splendid hotels, good water, fine mountain climate and beautiful scenery, could number its summer guests by thousands, instead of scores as at present. The place has wonderful possibilities as a summer resort, and if the authorities and citizens will look to its sanitary condition, by restoring the purity of the beautiful stream of water that meanders through the town; by paying proper attention to the cleanliness of alleys and back yards; by banishing pig-pens, cesspools and filthy slaughter houses, and thus make sure of the good opinion of strangers who come within its gates, there is no reason why its hotels and boarding houses should not be filled, to their utmost capacity, with guests every summer.

87. The Flooded Districts. In the month of May certain districts on the Potomac and Susquehanna were visited by a flood unprecedented in the history of the State. By this catastrophe a number of lives were lost at the time; and great danger to life and health was apprehended from the fact that large quantities of organic matter brought down by the flood was deposited in proximity to dwellings, and even in the yards and cellars, the houses and their surroundings being flooded and saturated.

It was feared that the vast amount of filth spread over so large an area would decompose and produce most deplorable results. It is believed, however, that these have been averted by the prompt and energetic action of the citizens, under the advice of the State Board of Health, which action will be described in a special report to be hereafter submitted, and which will contain a correspondence with Mayor Latrobe in reference to furnishing a small supply of disinfectants from the "flood fund" at his disposal. I regret to say that the aid asked for was refused, the reason assigned being that "The Committee decided that no part of the flood fund could be used for the purchase of disinfectants," *notwithstanding the unexpended balance in hand.* This great need, however, was in a measure supplied by the Ladies' Relief Committee of Emmanuel Church and other charitable organizations, which contributed liberally of their small fund for sanitary purposes.

It may be stated that this visitation has not been void of beneficial results, many filthy places having been washed out, which, together with the greater care and attention paid to sanitary matters, will be the means of saving a far greater number of lives than were lost by the flood, painful as the remembrance of that loss is.

88. **Sanitary Inspections.** In addition to the sanitary management of the Flooded Districts, in most of which the co-operation of the State Board of Health was asked and promptly obtained, the Secretary has visited a number of localities in the State, where his presence and advice were requested in matters of public sanitation. Several slight outbreaks of disease, occurring in various parts of the State, have been speedily checked by prompt action, and in no case has any waste of life taken place that could have been prevented by sanitary precautions. The local authorities and the people are becoming well educated to the necessity for promptness in such matters, and are not slow to solicit the co-operation of this Board.

The Secretary is greatly encouraged by the manner in which his work has been received, wherever it has extended.

Respectfully submitted,

C. W. Chancellor, M. D.,
Secretary and Executive Officer.

89. **Precautions Against Yellow Fever.** The appearance of a fatal case of yellow fever in New York city, in September, 1888, in the person of a distinguished citizen of Florida, who had recently left that pest stricken land, occasioned some apprehension that the disease might reach our own city, notwithstanding the vigilance of the City Health Department, and there was some wild talk of quarantining against Florida.

While there was really no ground for alarm, the State Board of Health held itself ready to act in conjunction with the municipal authorities in any measures which might be deemed necessary for the protection of the city, under the authority given it in the Acts of the General Assembly of Maryland of 1886, Chapter 22, Section 1, which provides, "That whenever the State Board of Health shall have cause to believe that there is danger of cholera, small pox, yellow fever or other dangerous or infectious disease invading this State, it shall be the duty of the said Board to take such action and adopt and enforce such rules and regulations as it may deem necessary to prevent the introduction or spread of such infectious or dangerous disease within the State ; and any person or persons, or corporation refusing or neglecting to obey such rules and regulations, shall be deemed guilty of a misdemeanor, and shall upon conviction thereof in a court of competent jurisdiction, be fined not less than fifty dollars, nor exceeding five hundred for every such offence." It was deemed proper, therefore, to inform the city authorities of the willingness of the Board to co-operate whenever their services might be required, and, accordingly, the following letter was sent to His Honor, Mayor Latrobe, by the Secretary of the Board :

90. Letter to Mayor Latrobe on the Subject.

Executive Office,
State Board of Health,
Baltimore, Sept. 22, 1888.

Hon. F. C. Latrobe, *Mayor.*

Dear Sir :—I take this method of saying that the State Board of Health will be glad to co-operate with the city authorities in any measures that may be deemed necessary to secure the city against a visitation of yellow fever. As to what may happen in the next few weeks prophecy is powerless to foretell. Much depends upon the weather, local cleanliness and the careful watching of those coming from infected districts. We should not forget that the epidemic of 1873, which cost Memphis 1,244 lives, commenced the 14th of September and only ended about the middle of November, while the terrible epidemic of 1878 reached to the 1st of December. These two epidemics made a mark in history, but for disgraceful panic the present heads the list, and visionary precautions seem to have taken the place of common sense and the ordinary instincts of humanity.

If we have an atmosphere untainted by the decay of vegetable and animal matter we have nothing to fear, but may meet the disease, should it come, with calm courage and extend to the afflicted that humane care which is characteristic of a Christian civilization. It is well, however, to prepare for possible contingencies, and when once cleaned up the sense of comfort and improved condition of health will induce us to continue the work.

One simple and efficacious sanitary measure is, as you are aware, entirely neglected, namely, the preserving of the purity of the soil. With our present system of cesspit and cesspool sewerage, the conditions of disease are always present *in posse*, and we cannot expect to exclude epidemics, though commerce and trade be interdicted and every approach to the city bristles with shotgun quarantines.

The influence which the law of quarantine is supposed to have in the protection of public health renders every recommendation that may affect it a matter at once of general interest and peculiar delicacy. I am not a believer in the efficacy of quarantines, except as practiced by the English government—inspection and disinfection—which view has been indorsed by four international sanitary conferences, viz., Constantinople in 1866, Geneva in 1878, Rome in 1885, and Vienna in 1887. The sanitary cordon has never accomplished any good, even when enforced by the bayonets of disciplined troops. If we could quarantine the winds, which sometimes convey the germs of disease hundreds of miles, we would possess a valuable safeguard ; but as we cannot do this, our only safety is to take care of the "conditions" and let the ubiquitous germs float unmolested "whithersoever the wind listeth."

Though I am altogether incredulous as to the efficiency of quarantines, especially the so-called *cordon sanitaire*, I would not be understood as opposing measures intended to quiet public alarm, often more disastrous to life than the epidemic itself. Such measures are sometimes necessary, though, it must be admitted, a painful commentary upon the intelligence of a community. Yours faithfully,

C. W. Chancellor, M. D.
Secretary and Executive Officer.

91. **Fever in an Asylum.** In August, 1888, there was, as stated in one of the foregoing reports, an outbreak of typho-malarial fever in the Asylum for Colored Orphans, near Melvale, Baltimore county. It was announced that 27 cases and several deaths had occurred. The matter was promptly investigated by Dr. Piper, President of this Board, and Dr. Jarrett, County Health officer, who reported that the house was badly drained and ventilated, which, coupled with the existence of a stagnant pond or marsh on the premises, no doubt gave rise to the disease. The Board of Trustees of the Institution promptly had the evils cited corrected, and no other case occurred.

92. **The Medical Practice Act.** This Act, entitled "An Act to promote the public health and regulate the practice of medicine in the State of Maryland," was drafted by the State Board of Health, and duly presented to the Legislature at the January session of 1888, with a view to obtaining a higher standard of qualification among the medical practitioners of the State, as well as to weed out the quacks and charlatans who prey upon the credulity and ignorance of the people, to the injury of the public health. After much discussion, and many fatal amendments, the Legislature finally passed the bill, and it was approved April 5th, 1888, by His Excellency Gov. Jackson, but an official copy was not furnished the Board until sometime in June, when it was duly considered by the Executive Committee. The Committee entertained some doubts as to the scope and powers of the Board under the Act, as well as of its ability, in the absence of any appropriation for this

purpose, to execute the provisions of the Act, and accordingly the question of doubt was submitted to Attorney-General Whyte, who furnished the following official opinion in a letter to the President of the Board :

93. Letter from Attorney-General Whyte.

ATTORNEY-GENERAL'S OFFICE,
BALTIMORE, June 28th, 1888.

DR. JACKSON PIPER,
President State Board of Health :

DEAR SIR :—In reply to the request of the State Board of Health communicated in your letter of 21st ulto., I beg to say that I have examined Chapter 429 of the Acts of the General Assembly, passed at January session, 1888, entitled "An Act to promote the public health and regulate the practice of medicine in the State of Maryland ;" and that, in my opinion, upon reason and authority, the said Act is constitutional and valid. It is similar, in its main features, to Acts which have been upheld by the highest courts in Illinois, Pennsylvania, West Virginia and in other States. Without enlarging on the subject, it seems to me that the decision in the case of the State vs. Dent, reported in 25 West Virginia, Rep. 1 (decided Nov. 1, 1884), covers fully the points on which its constitutionality is successfully maintained.

Secondly. The law, in no way, applies to "any person who has been practicing medicine continuously for ten years before the passage of the Act."

Thirdly. I do not understand that the "Board is to ascertain who are the parties subject to" the law, but that if persons who come under the law practice *without a certificate*, they are to be arrested and tried as other violators of law are dealt with.

Fourthly. The Board is entirely dependent on the fees received for the execution of the law, and it has no power to raise money in any other way to carry out the purposes of the Act.

Fifthly. The members can be summoned, as witnesses, to prove the non-compliance of any accused party with the law.

The failure of the Legislature in furnishing an appropriation for books, certificates, etc., cannot be remedied by the Board; but if the fees received are not large enough to pay these expenses, the law cannot be executed until the Legislature provides the proper material.

Yours very truly,

Wm. Pinkney Whyte,

Attorney-General.

It will be observed that in the *fourth* paragraph of the Attorney-General's letter he states that "The Board is entirely dependent on the fees received, for the execution of the law, and it has no power to raise money in any other way to carry out the purposes of the Act;" but no fees could be collected until the certificates were ready to be issued and all the other machinery was in place, such as books of record, notices, forms, etc. It was ascertained that the certificates and necessary books would cost from $150 to $200. Application was then made to the Comptroller of the State to know whether the Board would be permitted to borrow from the annual appropriation for the expenses of the Board in order to execute the provisions of Chapter 429 of the Laws of 1888, to which the Comptroller replied under date of September 13th, 1888, as follows:

94. Decision of Comptroller Baughman. "The appropriation made in the Act of 1880, Chapter 438 (for expenses State Board of Health), *cannot be used for the purpose of carrying into operation the Act of* 1888, *Chapter* 429."

The failure of the Legislature in furnishing an appropriation for necessary books, certificates, etc., under the opinion of the Attorney-General, rendered the Act inoperative "until the Legislature provides the proper means." Taking the promises into consideration the

Board, at a special meeting held September 26th, 1888, passed the following:

95. Resolution. *Resolved*, That the State Board of Health is in entire sympathy with the purposes of the Act of the General Assembly of Maryland, passed at January session, 1888, entitled "An Act to promote the public health and regulate the practice of medicine in the State of Maryland, and would gladly execute the provisions of said Act if it were possible to do so, but the Legislature having failed to furnish any appropriation whatever for books, certificates, clerical services, etc., and as the fees provided for in the Act are not available to pay the necessary expenses until the certificates, etc., are provided, and the said Board having no funds for that purpose are unwillingly constrained to forego the execution of the law until such time as the Legislature may provide the proper material."

96. Transportation of Dead Bodies. At this meeting of the Board the Secretary presented the following communication which he had received from Mr. J. E. Quick, Secretary of the National Association of General Baggage Agents in the United States:

97. Letter from National Association of General Baggage Agents.

Secretary's Office,
Detroit, Mich., Aug. 1, 1888.

C. W. Chancellor, M. D.,
Secretary State Board of Health, Baltimore, Md.

Dear Sir:—At a meeting of the National Association of General Baggage Agents, held in the city of New York, July 17th, 1888, the question of Transportation of Dead Bodies was referred to a committee of seven for recommendations, with the view of establishing some simple, effective rules, which could be the guide for all Railroads and other Transportation Companies in the United States and Canada, in the matter of transporting dead bodies.

At a subsequent meeting the following rules were submitted, with the recommendation that they be referred to a sub-committee to lay before the several State Boards of Health, National Conference of State Boards of Health, and National Association of Undertakers, for any recommendations they would make in the matter, and after such correspondence, said committee to send copies of corrected rules to all members of the Association prior to the next regular meeting which will be held at San Francisco, January 16th, 1889.

The rules are as follows, viz.:

1. The transportation of the bodies of persons dead of small pox, Asiatic cholera, typhus fever or yellow fever is absolutely forbidden.

2. The bodies of those who have died of diphtheria, scarlet fever, typhoid fever, erysipelas, measles, and other contagious, infectious, or communicable diseases must be wrapped in a sheet thoroughly satuated with a strong solution of chloride of zinc, in the proportion of one-half pound of chloride of zinc to a gallon of water; or a strong solution of not less than two per cent. of the bi-chloride of mercury, and encased in an air-tight zinc, copper or lead lined coffin, or in an air-tight iron casket, and all enclosed in a strong, tight wooden box. The coffin or casket must also be surrounded in space between coffin and outside box by sawdust saturated with a solution of chloride of zinc or bi-chloride of mercury of same strength as above.

3. In cases of contagious, infectious or communicable diseases, the body must not be accompanied by persons who, or articles which have been exposed to the infection of the disease. And in addition to permit from Board of Health, agents will require an affidavit from the shipping undertaker, stating how body has been prepared, and kind of coffin or casket used, which must be in conformity with rule 2, and that the health officer of the locality to which the body is consigned has consented to the proposed shipment, and has had such timely notice of the hour of its arrival within his jurisdiction as will enable him to supervise its reception.

4. The bodies of persons dead of diseases that are not contagious, infectious or communicable may be received for transportation to local points in same State when encased in a sound coffin or metallic case, and enclosed in a strong wooden box, securely fastened, so it may be safely handled. But when it is proposed to transport them out of the same State, or to another State, they must be encased in an air-tight zinc, copper or lead lined coffin, or in an air-tight iron casket. If any other kind of coffin is used, the body must be properly embalmed.

5. Every dead body must be accompanied by a person in charge, who must be provided with a ticket, and also present a full first-class ticket marked "Corpse" and a permit from Board of Health, giving permission for the removal, and showing name of deceased, cause of death, and whether of a contagious or infectious nature.

6. The permit from Board of Health must be issued in duplicate, the original to accompany body to destination, the duplicate copy will be retained by agent at initial point, and sent to the General Baggage Agent.

7. It is intended that no dead body shall be moved which may be the means of spreading disease; therefore all disinterred bodies, dead from any disease or cause, will be treated as infectious and dangerous to public health, and will not be accepted for transportation unless said removal has been approved by the State Board of Health, and the consent of the health officer of the locality to which the corpse is consigned has first been obtained.

In submitting these rules for your consideration, it is not assumed that they are now perfect, and we are simply asking your approval of them; on the contrary, we solicit any suggestions or recommendations which, in your opinion, will be in the interests of the public health, and at the same time not unnecessarily burdensome and expensive to the public.

In looking over the above rules the following inquiries are suggested: Is it policy to have a list of specified dangerous diseases that will not be carried, as in rule 1, and should this list stand or be extended?

There being a difference of opinion among health officers as to danger in transporting bodies dead of certain diseases, should we not take the safe side in case of doubt as in first part of rule 2?

Will the rule for preparing bodies for shipment be effective, or should there also be an injection of fluids in the cavities? What should be the extra expense of thus preparing dead bodies?

What should be the additional expense of ordinary air-tight zinc, copper, lead-lined or iron coffins or caskets as compared with other ordinary coffins or caskets that are not claimed to be air-tight? The question of expense in this matter is a very serious one, and of course must not be overlooked. Will this scheme be prohibitory in the case of people of ordinary or limited means?

Is there any standard by which undertakers are graded to ascertain whether competent or not? Are they examined before being allowed to practice the art of embalming, as are physicians before practicing their profession; if not, what assurance have the public of any safety even though a certain undertaker made oath that he had prepared a body for shipment in accordance with the rules? Should not each State require undertakers to take out a license and pass examination before a competent Board of Examiners before he is allowed to prepare a dead body for shipment out of that State?

Is there any penalty in your State for making false affidavit or issuing false certificate either as to cause of death, or as to preparation of the body for transportation; and if not, should there not be some legislation that will give the necessary protection? Who in your opinion should look after this matter?

Is it not desirable that all permits for the removal of dead bodies be issued by the Boards of Health, and can this not be done in all cases even in small towns or country districts?

Is it not desirable that a nearly uniform style of removal permits be used to insure definite and necessary information, to enable persons to transport dead bodies through several States without danger of being stopped at some intermediate point? Please send samples of permits used in your territory.

To enable the committee to prepare their report, we would request that all communications on the subject be sent to the Secretary at Detroit, Mich., on or before December 1st.

H. P. Dearing,
J. C. Lenix,
F. A. Zimmerman,
Sub-Committee.

J. E. Quick,
Secretary.

98. Action of the Board. In connection with the foregoing communication the Secretary presented the following resolutions, which were unanimously adopted:

"*Resolved,* That as railroads are the principal medium of communication among the people, the trunk lines spanning the continent and bringing to our doors inhabitants from all parts of the country, it is obvious that local rules and regulations interdicting the movements of population, be they ever so rigid, can afford but little protection against the spread of infectious or communicable diseases.

"*Resolved,* That as the bodies of the dead are transported in the same cars and among the baggage containing the wearing apparel of the passengers, the necessity for some effective regulations governing the transportation of said bodies, which will apply alike to all the States, is apparent, that this Board endorses the recommendations submitted for its approval by the National Association of General Baggage Agents."

99. Corrected Rules for the Transportation of Dead Bodies. In April, 1889, a conjoint communication was received from the General Baggage Agents of the Pennsylvania and Baltimore and Ohio Railroads, enclosing a copy of the corrected rules, all of which is given below as a matter of public interest. The Board readily acquiesced in the rules, which had already been virtually adopted by the preceding resolutions :

Baltimore, April 15th, 1889.

C. W. Chancellor, M. D.,
Secretary State Board of Health, Baltimore, Md.

Dear Sir :—We, the undersigned, General Baggage Agents of the railways interested in the matter of transporting dead bodies in the State of Maryland, would respectfully call your attention to the corrected rules and samples of forms approved at the San Francisco meeting of the National Association of General Baggage Agents, of which we are members.

You will note there have been several changes made in the proposed rules since they were submitted to the State Board of Health in your State, and we would therefore request that they all be submitted again for approval ; and that the proposed changes may be better understood, we enclose you that part of the record of our proceedings which gives the full report of the committee.

There is seemingly but one sentiment among health officers as well as railroad men ; that the interests of the public health demand uniformity in the matter of transporting the bodies of the dead, yet this is not an easy thing to accomplish, unless each State Board, and all for that matter, will yield a point in the interests of harmony, and after due consideration of all suggestions offered, we believe the rules now proposed cover all the essential features, and embody the sentiments of a larger proportion of those with whom we have corresponded, and harmonizes the conflicting opinions as near as it is possible, until the several State Boards of Health can get nearer together, and public sentiment demands some standard or authority by which undertakers are examined as to their competency in the matter of preparing dead bodies for shipment.

In the meantime, we think it advisable to make the start in this territory, believing we will soon be working under uniform rules throughout the United States and Canada. It is desirable, however, to accomplish this with as little friction as possible, and we would therefore suggest they go into effect about September 1st, of this year. Will this meet the approval of your Board? We suggest this date, as it will give ample time to give notice in the larger towns and cities, and to all undertakers.

Will you kindly lay the matter before the State Board of Health for approval, and will you advise Mr. J. E. Quick, Secretary, Detroit, Mich., of the result of your deliberations as soon as convenient. We would add that similar letters are being sent to the several State Boards of Health.

B. E. PEDDICORD,
G. B. A. B. & O. R. R.
F. J. MCWADE,
G. B. A. P. R. R., P. W. and B. R. R., N. C. Railway, and B. and P. R. R.

NATIONAL ASSOCIATION OF GENERAL BAGGAGE AGENTS,
OFFICE OF SECRETARY.

DETROIT, MICH., Feb. 15, 1889.

DEAR SIR:—At meeting of National Association of General Baggage Agents, held at San Francisco, January 16th, 1889, the following resolution was adopted, viz.:

Resolved, That the Secretary furnish each member of this Association with printed copies of memorandum of rules relative to the transportation of dead bodies, as approved at this meeting, and that each General Baggage Agent present same to the Boards of Health concerned in the territory traversed by his line, as desirable for general adoption, to the end that all abuses attending the transportation of dead bodies may be avoided, and the interest of all concerned be thereby promoted, and that said Boards of Health be requested to state in writing if they will conform thereto, or if not, to specify in what particulars, and to make any suggestions that may occur to them, and that each General Baggage Agent report the result of his correspondence at the next meeting of this Association.

In compliance with above rules as approved attached hereto. Please refer them as above.

Respectfully,
J. E. QUICK, *Secretary.*

RULES FOR TRANSPORTATION OF DEAD BODIES.

RULE 1. The transportation of bodies of person dead of small pox, Asiatic cholera, leprosy, typhus fever, or yellow fever, is absolutely forbidden.

RULE 2. The bodies of those who have died of diphtheria, anthrax, scarlet fever, puerperal fever, erysipelas, measles, and other contagious, infectious, or communicable diseases must be wrapped in a sheet thoroughly saturated with a strong solution of bi-chloride of mercury, in the proportion of one ounce of bi-chloride of mercury to a gallon of water; and encased in an air-tight zinc, tin, copper or lead-lined coffin, or in an air-tight iron casket, hermetically sealed, and all enclosed in a strong tight wooden box; or the body must be prepared for shipment by being wrapped in a sheet and disinfected by solution of bi-chloride of mercury as above, and placed in a strong coffin or casket, and said coffin or casket encased in a hermetically sealed (soldered) zinc, copper or tin case, and all enclosed in a strong outside wooden box of material not less than one inch and a half thick.

RULE 3. In cases of contagious, infectious, or communicable diseases, the body must not be accompanied by persons who, or articles which have been exposed to the infection of the disease. And in addition to, permit from Board of Health or proper health authority, agents will require an affidavit from the shipping undertaker, stating how body has been prepared and kind of coffin or casket used, which must be in conformity with Rule 2.

RULE 4. The bodies dead of diseases that are not contagious, infectious, or communicable, may be received for transportation to local points in same State when encased in a sound coffin or metallic case, and enclosed in a strong wooden box, securely fastened so it may be safely handled. But when it is proposed to transport them out of the State to an Inter-State point (unless the time required for transportation from the initial point to destination does not exceed 18 hours) they must be encased in an air-tight, zinc, tin, copper, or lead-lined coffin, or an air-tight iron casket, or a strong coffin or casket encased in a hermetically sealed (soldered) zinc, copper, or tin case, and all enclosed in a strong outside wooden box of material not less than one inch thick. In all cases the outside box must be provided with four iron chest handles.

RULE 5. Every dead body must be accompanied by a person in charge who must be provided with a ticket, and also present a full first-class ticket marked "corpse," and a transit permit from Board of Health, or proper health authority, giving permission for the removal, and showing name of deceased, age, place of death, cause of death, (and if of a contagious or infectious nature), the point to which it is to be shipped, medical attendant, and name of undertaker.

RULE 6. The transit permits must be made with a stub to be retained by the person issuing it, the original permit must accompany the body to destination, and two coupons; the first coupon to be detached by agent at initial point and sent to the General Baggage Agent, and the second coupon by the last train baggageman. The stub permit, and coupons, must be numbered so the one will refer to the other, and on back of permit will be a space for undertaker's affidavit, to be used in cases of contagious or infectious diseases as required by Rules 2 and 3.

Rule 7. The box containing corpse must be plainly marked with paster, showing name of deceased, place of death, cause of death, the point to which it is to be shipped, number of transit permit issued in connection, and name of person in charge of the remains. There must also be blank spaces at bottom of paster for station agent at initial point, to fill in the form and number of passage ticket, where from, where to, and route to destination of such ticket.

Rule 8. It is intended that no dead body shall be moved which may be the means of spreading disease, therefore, all disinterred bodies, dead from any disease or cause, will be treated as infectious and dangerous to public health, and will not be accepted for transportation unless said removal has been approved by the State Board of Health, and the consent of the health authority of the locality to which the corpse is assigned, has first been obtained, and the disinterred remains enclosed in a hermetically sealed (soldered) zinc, tin or copper-lined coffin or box, or a box encased in hermetically sealed (soldered) zinc, tin, or copper case.

102. The Chesapeake and Ohio Canal. At the quarterly meeting of the Board in July the principal business was the consideration of the Secretary's report which called attention to the unhealthy condition of the Chesapeake and Ohio Canal occasioned by the flood of May 31st, which was unparalleled in the history of the State. By this catastrophe a number of lives were lost at the time ; and, as stated in the preceding quarterly report, great danger to life and health was apprehended from the fact that the contents of many filthy places,—pig-pens, outhouses, etc., along with a large quantity of organic matter brought down by the flood from other sources were deposited here and there in proximity to dwellings, and in some instances in the dwellings. The Canal also became a source of nuisance. At many points the water had been drained, partially or wholly, from it, leaving the bottom and banks covered with a slimy deposit of organic matter, animal and vegetable, which was decomposing under the influence of a July sun, filling the air for miles around with the gaseous products of such decomposition. It was feared that this condition, unless actively combatted, would produce deplorable results, and hence the Secretary visited in person nearly every locality on the line of the Canal, from Cumberland to Point of Rocks, where danger to the public health was apprehended. Indeed, almost his entire time for three months was devoted assiduously to the work of correcting the unsanitary conditions occasioned by the vast amount of filth in a state of fermentation and decomposition spread over so large an area. In this work he was ably seconded by the local authorities and the people generally, who appreciated the necessity for adopting and enforcing the most rigid sanitary precautions, in the face of threatened disease. The result was most gratifying. By refilling the Canal with water, wherever it was practicable to do so, and thereby covering over the organic deposits, and by the free use of disinfectants at such points in the Canal as could not be flooded, and wherever there were large deposits of decomposing matters, an epidemic was no doubt averted. Only a few slight outbreaks of sickness, of a malarial type, occurred here and there; but by prompt action these were speedily and effectually checked.

103. **Typhoid Fever at Pikesville.** On the 22d day of July, 1889, the attention of the Secretary was called to the existence of typhoid fever of a malignant type at Pikesville, a village in Baltimore county, about eight miles from the city. An official investigation disclosed the fact that the town was in a most filthy condition, and an analysis of the waters of several wells showed that they were fearfully polluted by sewage from foul privy pits, pig-pens, stables and other sources of contamination. A personal appeal was made to the citizens

to "clean up" their premises, and the following circular was distributed generally and posted in the town:

104. Circular to the Citizens of Pikesville.

MARYLAND STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
BALTIMORE, August 8th, 1889.

To the Citizens of Pikesville:

There is no single source so productive of typhoid fever as that of polluted drinking water. Because water comes sparkling from the ground, clear, cool and refreshing, it is not safe to conclude that it must be pure and beyond question absolutely free from poison germs. The analysis of several specimens of well water from Pikesville shows that though they were clear and sparkling and sweet to the taste, not a single one was free from contamination. The wells are in too close proximity to privies, kitchen drains, barn-yards, pig-pens and other sources of filth, which not only pollute the water supply of the town, but contaminate the soil and surrounding air. Absolute cleanliness of premises must be observed, and all accumulations of filth removed from day to day.

The age and depth of the wells and the exceptionally wet season have also had much to do with the amount of impurities found in the water. Let every well, therefore, be thoroughly cleaned, and protected against all sources of pollution. Until this is done, it will not be safe to use any of this water for drinking or dietetic purposes, which has not been recently boiled or distilled.

Boiling the water is the only absolute safety under the circumstances.

C. W. CHANCELLOR, M. D.,
Secretary State Board of Health.

The advice contained in the circular, as well as the personal appeal made by the Secretary, were generally heeded, and very soon there was a marked decrease in the number of cases; indeed, it was reported that no new case developed after the circular was issued, except in the family of one William Foley, who disregarded the advice given, or at least failed to conform to it in such a manner as to satisfy the sanitary requirements of the Board. A second complaint was lodged against this party, and the following official notice was placed in the hands of a legal gentleman to be served on him:

105. Notice to Abate Nuisance.

To Wm. Foley, Esq.:

Whereas complaint has been made to the State Board of Health that your premises, situated in the town of Pikesville, Baltimore county, State of Maryland, is in a state of nuisance, dangerous to health, and the matter having been investigated by said Board of Health, it has been found that the nuisance complained of is such as to injuriously affect the adjacent property, and is calculated to injure the health and endanger the lives of persons residing in the neighborhood thereof, you are hereby notified and required to abate said nuisance within five days from the service of this notice, otherwise you will be proceeded against according to the law made and provided in such cases. (See chapter 12, Laws of 1886.)

The nuisances on your premises consist, first, of an offensive open privy-pit so arranged that the contents thereof have percolated, and are likely to percolate and saturate the surrounding soil to the extent of draining into and poisoning the water of wells used for domestic purposes. The poisoned effluvia arising from this privy is also likely to penetrate and contaminate the air of your own and your neighbor's houses; secondly, of fermented filth, solid and liquid, about your stable and within the stable itself, due to neglect of proper cleaning, to the protracted use of dirty and sodden litter, to the soaking of urine and excremental matter into the floor, the result of its bad construction or of deficient provision for drainage, to too prolonged retention of manure in heaps on the premises and its consequent fermentation; thirdly, of an extremely filthy, ill-kept and ill-managed pig-pen, with an open floor and a cesspool beneath it.

Such nuisances are held to be "nuisances dangerous to health," and may be reckoned among the deadliest factors of the fatal disease which has prevailed in Pikesville for several months, and which has carried off several members of your own immediate family. In stating this opinion of the fatal influences of such nuisances it is not intended to refer to them in their minor degrees, but in such degree as they now exist upon your premises,—such degree as any average man or woman should be disgusted at.

You are hereby notified and required to abate said nuisances in the following manner:

First. You are required by the State Board of Health, acting under the provisions of Chapter 12, Sec. 1, of the Laws of 1886, to thoroughly cleanse your privy by removing all noxious matters in or about it; to disinfect the soil beneath it with a solution of sulphate of iron (common copperas), one and a half pounds of the material to one gallon of water, and, subsequently, to provide water-tight receptacles beneath the privy seats to receive the excrementitious matters of your household that now fall or are cast upon the surface of the ground, and by soakage are liable to drain into wells of drinking water. The contents of these receptacles must be covered with dry earth or ashes from day to day, and removed as often as may be necessary, and whenever the receptacles become nearly full.

Second. You are required to keep your stable and stable lot at all times clean, and to provide proper drainage, either by pipes or impervious channels for conveying the liquid matters to a safe distance from any dwelling or source of water supply; to remove all dung from the stable and stable-yard at least once in forty-eight hours between the months of April and October, and every two weeks during other times.

Third. You are required to place and maintain your pig-pen in such a condition of cleanliness that it will not be a source of nuisance, from either effluvia or soakage, to persons near enough to be affected thereby. In order to protect the public health as well as that of your own family, you are required, should you continue to keep pigs on your premises, to provide a flooring for the pen of some material impervious to water or slops, properly sloped to a channel running along the front, back or side of the pen, and leading to a proper drain inlet outside the sty. All manure and litter must be removed from the pen at least once in forty-eight hours during the months of May, June, July, August and September, and weekly during other months; and the pen must be thoroughly cleansed by washing or otherwise after each removal of the manure and litter. You are also hereby required to drain and fill up the cesspool under the pig-pen on your premises, and do such other things as may be necessary to abate the nuisances complained of.

C. W. CHANCELLOR, M. D.
Secretary and Executive Officer.

P. S.—This notice was given to Capt. Randolph Barton, one of the complainants, to be served on Foley, and as no return has been made, it is assumed that the directions contained therein have been satisfactorily complied with.

106. Nuisances at Frostburg. About the middle of June, 1889, complaint was made to the State Board of Health by Drs. Charles and Jones, two legally qualified practitioners of medicine, that the slaughter houses of Messrs. Wilderman, Robinson & Eichorn, in or near Frostburg, Alleghany county, were in a state of nuisance dangerous to health. The matter was promptly investigated by the Secretary, and the nuisance complained of being found to be such as to injuriously affect adjacent property, and also calculated to endanger health or life, the following notice was served on each of the parties respectively, through the Hon. David Sloan, State's Attorney for Alleghany county:

107. Notice to Abate Nuisance.

OFFICE STATE BOARD OF HEALTH.

BALTIMORE, June 29th, 1889.

MR. ROBERT M. WILDERMAN:

Complaint having been made at this office that the present condition of your slaughter house and premises, located at or near the town of Frostburg, Alleghany county, Maryland, is in a state of nuisance dangerous to health, and the matter having been duly investigated, it was found that the nuisance is such as not only to injuriously affect the adjacent property or district and endanger the health and life of persons living in the neighborhood, but also to conduce to the injury of the public health through the influence of the septic effluvia which the dressed carcasses of animals are likely to imbibe when hung up in a filthy slaughter house.

You are, therefore, required to abate the nuisance complained of *within fifteen days of the service of this notice*, either by ceasing to use the premises as a place for slaughtering or pounding animals, and subsequently to thoroughly cleanse and disinfect the said premises, or by executing the following directions:

1. *As to the arrangement and construction of the present building, etc.*

[*a.*] The floors of the present buildings to be entirely removed and substituted or replaced by a floor of some material impervious to water and filth, of sufficiently even surface to be capable of ready and thorough cleansing with water and brush. The best paving is some concrete or asphalt composition, sufficiently hard and firm to resist rough usage, and sufficiently rough not to be slippery, laid on a good foundation of brick or stone.

[*b.*] The inner surface or walls of the house to be thoroughly cleansed and covered with a layer of lime-wash which must be renewed at least once a month. The lower parts of the wall, to the height of five or six feet, should be covered or lined with smooth hard wood, cement, slabs of slate, zinc sheeting, or some similar impervious material capable of being washed clean with water; if of wood it should be covered with a layer of asphalt paint or coal tar.

[*c.*] The yard must be thoroughly cleansed and kept clean; it should be paved and well drained, and all offensive matter removed from time to time, or as often as may be necessary to prevent nuisance.

[*d.*] The plank floor of the pens where pigs or other animals are pounded must be taken up, and the accumulated mass of filth beneath it removed; the floor of the same must be constructed of some material impervious to water, in order that the filth accumulating may be easily removed; and such filth accumulating in and about the same must be removed at least once in twenty-four hours. The meat of pigs fed on the offal of slaughtered animals is not fit to use as food for human beings.

2. *As to the conduct of the business of slaughtering.*

[*a.*] During the process of slaughtering as much care as possible should be taken to prevent the discharge of blood or other animal matters upon the floor of the slaughter house. The emptying of the contents of the intestines, etc., should be performed in a separate place, and any filth must be swept up from the floor and taken away at short intervals.

[*b.*] Hides, skins, blood, fat, offal, dung and garbage must be removed from the slaughter house as speedily as possible, say within twelve hours after the slaughtering has been done, and while they remain on the premises they must be kept so as not to become a source of nuisance. Where hides or skins are necessarily retained for a day or two before they can be removed, they should be brushed over on the fleshy side with a solution of carbolic acid or some other anti-septic. Fat should be freely exposed to the air in a cool place. Blood, offal, dung and other garbage must be placed in covered, movable receptacles constructed of galvanized iron or other non-absorbent material. A tight barrel coated on the inside with asphalt paint or coal tar will answer the purpose. Such articles as have been last mentioned must be removed from the premises within at least twelve hours after the slaughtering (it would be better to remove them immediately) in the vessels in which they have been placed. A dung and blood pit is a poor substitute for immediate removal, and should not exist in any slaughter house.

[*c.*] As soon as the slaughtering is completed, the whole slaughter house floor and walls, (to the height of the impervious portion) must be thoroughly washed with water, and the pound thoroughly cleansed. All the vessels and implements used in the slaughtering, or brought from outside into the premises, should be made and kept clean and sweet. The inner walls of the slaughter house and pound or pig-pens should have their surfaces periodically renovated by lime white-washing, to which a small quantity of carbolic acid may be advantageously added.

Should you fail to comply with the above requirements within the time specified, legal steps will be instituted immediately, and you will be proceeded against according to the law made and provided in such cases.

By order of the State Board of Health.

C. W. CHANCELLOR, M. D.
Secretary and Executive Officer.

It will be observed that the notice is both mandatory and advisory; but it was only expected that the parties would exercise due diligence in conforming to the requirements of the Board by placing their respective establishments in the best sanitary condition possible under the circumstances. This was done with commendable promptitude by two of the parties, viz., Messrs. Robinson and Eichorn; but Mr. Wilderman refused or neglected to comply with the requirements within the specified time, and the Secretary accordingly made a complaint in due form of law to Judge Hoffman of the Circuit Court of Alleghany, who thereupon issued a summons, requiring Wilderman to appear before him on Saturday, August 12th, 1889, to show cause why he had not complied with the orders of the State Board of Health.

108. Proceedings Against Wilderman. The following publication from the *Cumberland Alleganian* of the 15th of August is a correct statement of the legal proceedings taken before Judge Hoffman:

109. Report of Proceedings in Cumberland "Alleganian."

FROSTBURG'S NUISANCE CASE.

MR. WILDERMAN IN COURT TO ANSWER THE CHARGES PREFERRED BY THE STATE BOARD OF HEALTH—VALUABLE TESTIMONY OF DR CHANCELLOR.

Saturday morning, at 10 o'clock, the case of the State *vs.* Robert M. Wilderman, for maintaining a nuisance in or near the town of Frostburg, was taken up, with State's Attorney D. W. Sloan and J. N. Willison, Esq., representing the State, and B. A. Richmond, Esq., for the traverser.

Mr. Wilderman was served with a lengthy notice containing mandatory and suggestive clauses as published in this paper some time ago. Mr. Wilderman, it was alleged by the Board of Health, failed to comply with the notice. The testimony in the case showed conclusively that a nuisance was maintained, and that Mr. Wilderman had given orders to his son to have the slaughter house cleaned during his absence, but that he neglected it.

110. Secretary Chancellor's Testimony. Dr. C. W. Chancellor, in his testimony, said that—

"The effluvium nuisances arising in connection with slaughtering may depend, first, on the uncleanly manner in which the animals are kept prior to slaughter.

"Second, on the uncleanly condition of the slaughter house (a condition which is aggravated when it is not properly paved and drained), or on an uncleanly mode of conducting the several processes of slaughtering; where there are no proper means of drainage, blood and filth may flow out upon the surface of the ground outside the slaughter house, and there stagnating and becoming decomposed they will give rise to offensive effluvia.

"Third, on the retention and accumulation upon the premises of hides, skins, blood, fat, offal, dung and garbage which, after a time varying with the state of the weather, undergo decomposition and become offensive.

"Fourth, on the uncleanly condition of blood tubs or other receptacles, either kept in the slaughter house or in the yard.

"Fifth, on blood and other decomposable animal liquid matters flowing into drains badly constructed, or over the surface of the ground. The utmost care is necessary to prevent a slaughter house becoming a nuisance, even when the premises are properly arranged for the business. The nuisance arising from a filthy slaughter house may, by their operation on the senses, produce similar functional disturbances to those which evildoers from other sources are apt to occasion, and they are undoubtedly injurious to the health of persons exposed to their influence.

"Dr. Alfred Carpenter, of London, has stated his belief that blood and garbage from slaughter houses, when undergoing decomposition, may cause the development of scarlet fever or diphtheria in persons exposed to their offensive effluvia. There is also another less direct way in which the effluvia from a badly kept and badly managed slaughter house may conduce to the injury of the public health, namely, through the influence which the septic effluvia from them may exert upon the recently killed meat.

"When the slaughter house is charged with the septic effluvia the meat not only cools slowly and 'sets' slowly, but is liable to imbibe septic matters from the slaughter house atmosphere. Septic effluvia must be abundantly present in the air when the slaughter house is badly kept, and badly arranged or managed. Such effluvia, for instance, may originate from filthy pig-pens adjoining or near the slaughter house, from blood or filth left in the slaughter house, incrusted upon the rails or lying in the fissures of the flooring, from skins or fat too long retained, or from a catch-basin or drain having its inlet within the slaughter house. Such slow 'setting' of the meat and absorption of septic ferments are apt to conduce to early decomposition of the meat, especially in the warmer season of the year.

"It is well known that some meat, apparently good and wholesome—meat not obviously tainted—may produce when cooked and eaten, very serious disturbances in the system of the consumer, symptoms distinguishable with difficulty from symptoms of irritatest poisoning. The several and fatal diseases called the *Trachina disease*, caused by a microscopic worm (trachina spiralis) in the flesh, is introduced into the human body by eating the flesh of the hog, in which the parasite or worm lies dormant. The hog obtains the trachina from rats, which are usually abundant about slaughter houses, and which the hog often kills and eats. *No pig should be kept in or about a slaughter house. The flesh of pigs fed on slaughter house refuse is not fit for human food.*"

111. **Order Made by Judge Hoffman.** The court, after hearing all the testimony and arguments, issued the following order, thereby granting the accused an extenuation of time to rid the community of one of those obnoxious nuisances :

"Upon consideration of the testimony on the foregoing case, it is, this 10th day of August, 1889, by the Circuit Court for Allegany county, ordered that Robert M. Wilderman be and he is hereby required on or before the 24th day of August, 1889, to comply with the orders of the State Board of Health, passed June 29th, 1889, so far as to put his slaughter house and premises in such a condition as not to endanger health or create nuisance; and that final termination of this case be suspended, under section 37, article 43 of Poe's Code of General Laws, until August 26th, 1889, after which, if this order is not complied with, the court will proceed to take further and final action herein."

112. **Lake Roland as a Source of Nuisance.** On the 3d of September, 1889, the attention of the Secretary was called to the condition of Lake Roland by Attorney-General Whyte and others residing near the lake, who were apprehensive that the exposure of its bed and banks, at this particular season, would give rise to sickness. An examination of the lake, made on the 5th day of September, showed that a large area of organic matter or sediment deposited on the banks and bed of the lake had been for some days exposed, by drawing off the water, to the action of a heated atmosphere, and was likely to become a nuisance detrimental to the health of the neighborhood by undergoing fermentative decomposition or putrefaction. With this view of the case, presented by the State Board of Health, the Water Board promptly decided to defer dredging operations until a more auspicious season, and allow the lake to refill with water.

113. **Letter of Secretary Chancellor to Mayor Latrobe.** Following is the correspondence which took place between the Secretary of the State Board of Health and the Water Board:

Dear Sir:—The attention of the State Board of Health has been called to the dangerous conditions existing at Lake Roland, occasioned by the low water level of said lake at this time, coupled with the upturning and removal of a large mass of organic deposit.

It is feared that the exposure to the sun's rays at this season, of such an accumulation of filth, spread over so large an area as that uncovered by the lowering of the waters of the lake, especially at or near the mouths of its several tributaries, will eventually decompose and produce sickness. These streams, though small, collect the refuse animal and vegetable matters from quite a large area, and deposit them on the bottom and sides of the lake, but principally at the points where they severally *debuche*, forming at such places large accumulations of deleterious matters which are now exposed to a heated atmosphere, and being thus subjected to the process of fermentative decomposition, will most probably develop the germs or sporules of disease.

Add to this the significant fact, that in addition to the ordinary impurities, these tributaries collect and carry a great deal of sewage and refuse matters into the lake from the surrounding farm houses and residences, and we may form some idea of the noxious character of the mud which covers the bottom and sides of Lake Roland, and which is now, to a considerable extent, exposed to fermentative action, and unless recovered with water is likely to produce a host of micro-organisms or disease germs.

The importance of this subject will hardly be questioned, whether we view the nuisance as a probable cause of malarial manifestations, or as a predisposing cause which may sap the foundations of health, and open wide the gates for graver maladies, such as diphtheria, typhoid fever, dysentery, scarlet fever, &c.

Now, if to refill the lake with water, and thereby cover the deposits above referred to, would be the means of preventing sickness and perhaps saving valuable lives, does it not follow that failing to do so would be in the highest degree criminal, morally if not legally? We therefore petition your honorable Board to cause the lake to be *immediately* refilled with water to its usual level, until such time as it may be deemed safe to proceed with the work of dredging, otherwise you will be proceeded against according to the laws made and provided in such cases.

Respectfully, &c.

C. W. Chancellor, M. D.,
Executive Officer of the Board.

114. Mayor Latrobe's Reply.

MAYOR'S OFFICE,
BALTIMORE, September 10, 1889.

DR. C. W. CHANCELLOR,
Secretary State Board of Health.

DEAR SIR :—Your letter in reference to the water in Lake Roland was duly received and referred to the Water Board. The matter came up for consideration of the Board at its meeting on Friday last. The Secretary was directed to communicate to you the action taken by the said Board.

I am, very truly yours,
FERDINAND C. LATROBE, *Mayor.*

115. Letter from the Water Board.

OFFICE OF THE WATER BOARD,
CITY HALL,
BALTIMORE, Sept. 11th, 1889.

DR. C. W. CHANCELLOR,
Executive Officer State Board of Health, City:

DEAR SIR—I have been requested by the Water Board of Baltimore city to acknowledge the receipt of your communication of the 6th inst., and to state that the frequent rains of the past summer brought down Towson branch a large quantity of sand, nearly closing the culvert under the railroad embankment, thus rendering the lowering of the water in the lake a necessity, as the silt could only be removed by hand.

After the water was lowered Judge Fisher and others, residents upon the line of Roland Run, asked that the deposit at that point should also be removed. An effort was made to comply with their request, but upon complaint being made by ex-Governor Whyte and others, work was promptly suspended.

Filling the lake, as you suggest, is a matter beyond the control of the Board, as the supply barely equals the demand, and no appreciable gain in the volume of water flowing into the lake can be expected until the commencement of the autumnal rains.

Respectfully,
JOHN F. HUNTER,
Secretary.

116. Detailed Work of the Office. In addition to the foregoing a large amount of detailed work has been done by the Secretary, which, however, is not of sufficient importance to be recorded in this report. During the year 1889 he has made nearly one hundred visitations and inspections. The most fruitful sources of nuisances in the State are the filthy pig-pens, slaughter houses, stable yards and privy cesspools, and to these iniquitous places may be referred at least one-third of all the sickness that prevails in the State, to say nothing of the great discomfort they occasion to those who of necessity must live in proximity to them. The pig-pen especially is a sanitary nightmare upon the body politic.

117. Appropriations and Expenditures.

FINANCIAL STATEMENT.

APPROPRIATIONS.

For expenses of Board 1888	$1,200.00
For expenses of Board 1889	1,200.00
For postage on reports	50.00
Total appropriations	$2,450.00

EXPENDITURES.

For traveling and other necessary expenses of Board for two years ending December 31st, 1889, including postage, express, etc., on 3,000 reports, as per vouchers filed	$2,205.47
Balance	$ 194.53

PART V.

SELECTIONS AND ANNOTATIONS.

THE GERM ARMY—HOW IT MAY BE ROUTED.*

It is a favorite notion of modern physiologists that the human body is a sort of body politic,—a commonwealth inhabited by an immense multitude of living cells. It is almost impossible not to think of these cells as reasoning beings, as we find each struggling for its own existence but dependent on its neighbors, and working with them in the common object of building up the tissues of the body,—turning food into muscle and nerve.

In the midst of this "busy whirl of industry," these cells are constantly changing, giving birth to new cells, dying,—and the human body, like the great world we inhabit, is the constant theatre of birth and death.

These invisible cells have their invisible enemies; these enemies are popularly called germs. When these germs of disease gain an entrance to this citadel—the human body—through the air we breathe or the water we drink, they commence what Virchow calls a "struggle" with these cells, and we very properly speak of an "attack" of disease.

Vivid pictures have been drawn of this battle, how sometimes the germ is destroyed by the cell, how sometimes it conquers the cell, bursts it open, and rushes to destroy other cells. Perhaps it might be more accurate to speak of the germs breaking up the body compounds into poisons, each germ producing its own peculiar poison, its own peculiar symptoms, so that a sick man is like a city that has been sacked, plundered, and debauched by a foreign soldiery, all the healthy avenues of circulation blockaded and clogged.

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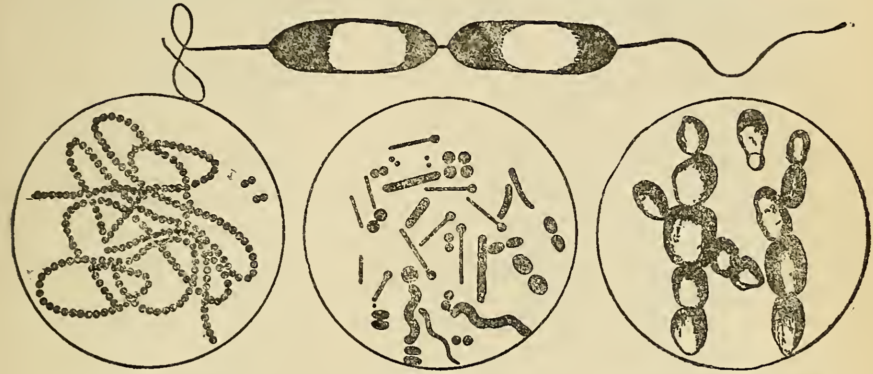
* From a paper by A. Arnold Clark, published in the last Report of the Michigan State Board of Health.

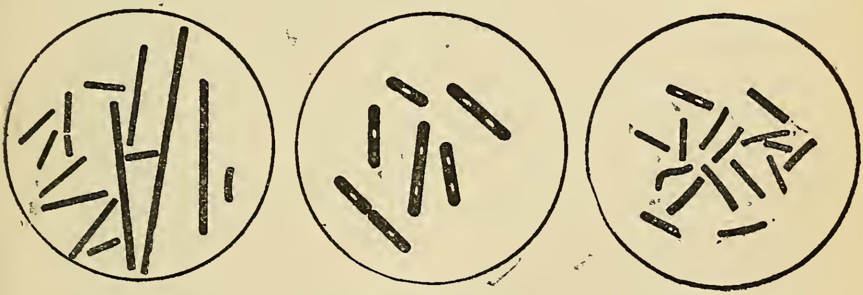
Without entering into an intricate explanation of how these germs produce disease in the human body, it is enough to say that where the vital forces of the human body are stronger than the germs, we have what is called a light attack. At times we have for a while a drawn battle, then the citadel is rebuilt from its ashes. When, on the other hand, these little soldiers of the Great Destroyer win a complete victory, the citadel is taken, the body dies, and we realize the truth of Victor Hugo's words: "It is with the infinitely little that the infinitely great conquers us."

118. **Non-Pathogenic Germs.** Not all of these "infinitely little" germs are the enemy of man. We have to thank them for our daily bread, our vinegar, and our beer. In the accompanying diagram you will notice a picture of the yeast-plant. This is the great brewer which turns our barley into beer and our grape juice into wine. As it is impossible to tell at a distance whether an army is friendly or hostile, without a field glass, so it is necessary to magnify all of these pictures. When I tell you that the germs in these diagrams are magnified many thousand times, you will see how "enormously small" they are.

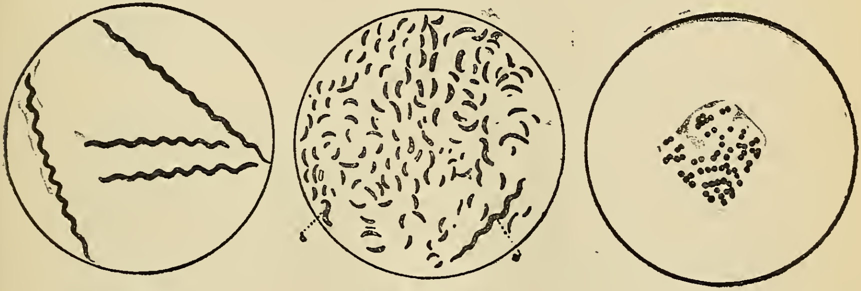
119. Diagram Showing Microscopic Appearance of Germs.



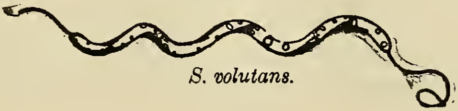
Chains of micrococci. *Putrefaction.* *Saccharomyces cerevisiæ.*



Tuberculosis. *Typhoid Fever.* *Anthrax.*



Relapsing Fever. *Asiatic Cholera.* *Erysipelas.*



S. volutans.

In the foregoing plate are exhibited eleven specimens of micro-organisms, which are magnified approximately, as follows:

Bacterium Termo,* about	2,000	diameters.
Saccharomyces Cerevisiae (Yeast), about	500	"
Putrefaction (Bacteria),† about	1,200	"
Chains of Micrococci,‡ about	1,400	"
Tuberculosis (Baccillus), about	1,100	"
Typhoid Fever (Bacillus),† about	1,100	"
Anthrax (Bacillus),† about.	1,400	"
Erysipelas (Micrococci),† about	1,300	"
Asiatic Cholera,† about	800	"
Relapsing Fever (Spirillum),† about	1,300	"
Spirillum Volutans,* about	500	"

The ancients, unable to understand the wonderful process of fermentation, knowing quite well that it could be no mere chemical process, spoke quite reasonably of the "spirit of wine." "O, thou invisible spirit of wine! if there is no other name by which I may call thee, then I will call thee,"—saccharomyces vini. When you ladies can your fruit, you know that by boiling it and keeping out the air it will not ferment. You have kept out the germs of fermentation floating in the air.

In the same way that this yeast-plant turns our grape juice into wine, this bacterium termo (see first figure in the plate) turns sweet meat into carrion, and these comma-shaped germs here (near bottom of plate) make a well man sick with Asiatic cholera.

120. Rapid Multiplication of Germs. But how, you ask, can so few germs as may find an entrance into your fruit on one exposure to the air, produce this dreadful havoc of fermentation? How can so few germs as are sometimes carried in a letter cause such dreadful outbreaks of disease? The answer lies in the rapid multiplication of these germs.

There are two ways in which germs reproduce.

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* "Bacteria," by Dr. Antoine Magnin and George M. Sternberg, M.D., F. R. S., p. 40.

† "Microscopical Technology." Dr. Carl Friedlaender. Frontispiece.

‡ The Practitioner (London), Vol. XXXII, p. 261.

Usually one germ lengthens out and divides, producing two. Sometimes a bright oval spore or seed is formed in the germ, the germ is broken, and the new germ is formed. This spore is the egg of a new germ. Think of an organism not so large as the point of a pin laying an egg!

In the rapid multiplication of these germs there is a good chance for a play of the imagination. Cohn saw the bacillus subtilis divide every twenty minutes. Assuming that each germ divides into two only once each hour, then in two hours four will be formed; in three hours, eight; in four hours, sixteen; in five hours, thirty-two; in six hours, sixty-four, or at the close of twenty-four hours, at this rate, there would be seventeen million descendants of one germ. Or in five days, at this rate, the descendants of a single germ would, says Cohn, fill all the oceans of the earth, and yet they are so small that if drawn up in battle array millions of them may be crowded into a cubic inch. And though they are so light that Tyndall saw them dancing in the sunbeam, yet Cohn estimates that in five days the descendants of one germ would weigh 15,000,000 pounds. Of course germs do not multiply this fast, because they lack the food, and for other reasons, but it is only when we understand their power of rapid reproduction that we can understand those great epidemics which sometimes take great cities by storm, and even depopulate nations.

It is this rapid multiplication which proves these germs to be living matter. You can dilute strychnine and make it harmless—it doesn't reproduce. You can't dilute the yeast-plant, because it does reproduce. "A little leaven leavens the whole lump." I haven't time to mention the many experiments by which it has been proved that these germs do not develop spontaneously—that each reproduces after its own kind. When you can keep the germs of fermentation out of your fruit, **121. They do not Develop Spontaneously in the Can,** and the fruit does not ferment. So the germs of scarlet fever no more arise in the air out of nothing than birds do. It was formerly thought that animals developed spontaneously. Von Helmont gave a formula for the spontaneous production of mice: "Take a dirty shirt, put into it some grains of wheat, subject the whole to heat, and at the end of a certain time there will be a transmutation of the wheat into mice." People used to think that the ooze of the Nile turned into eels. So when contagious diseases were first studied, it was claimed that they developed *de novo*. Scarlet fever and diphtheria were attributed to dirty surroundings, and when this wouldn't work, to the "will of God." All this is a thing of the past. A field full of thistles is an indication that the seeds of thistles have been wafted there, and as you can't gather figs from thistles, you can't get diphtheria from anything but diphtheria. There was no scarlet fever in this country until the germs of scarlet fever were brought to this country 150 years ago from a previous case, and if the germs of scarlet fever were all destroyed to-night, scarlet fever would be again a disease unknown. Diphtheria no more arises from the smell of decaying vegetables than bees are generated by the smell of decaying meat, as Virgil believed. Bad smelling marshes no more give birth to typhoid fever than to snakes and frogs, as the ancients thought. You can no more spontaneously generate a case of glanders than you can the horse that has it.

Koch has given a series of rules which must be followed before it can be said that any given germ has caused a given disease. The germ must be found in the blood or diseased tissues of the person sick; it must be isolated and cultivated and injected in some animal producing the symptoms of the disease, and it must again be found in the diseased tissues of the animal.

This has been done in some diseases, and the germs thus studied are pictured in the accompanying diagram. Before referring to them in detail, I should say that there is almost an

122. Infinite Variety of Germs. Without attempting any scientific classification, I may say, briefly, that there are three forms most usually met with, [1], those round like a ball (called micrococci); [2], those long like a lead pencil (called bacilli), and [3], those shaped like a corkscrew (called spirilla.) In the process of division they form chains and swarms. They shape themselves into columns, platoons, phalanxes, squares, and go through as many evolutions as our best trained military troops. They form colonies which are visible to the naked eye, though individual germs are not. You can see an army at a distance where you cannot see a soldier.

The largest of these germs is the *spirillum volutans,* which is one three-hundredths of an inch long—quite a giant.

Many of these bacilli and spirilla have flagella or cilia by which they move about. You will notice these threads in the bacterium termo and spirillum volutans in the accompanying diagram. They are as much smaller than the germ as the lion's tail is smaller than the lion.

Cohn, describing movable bacteria, said that swarming in a drop of water they looked like an ant hill. Swimming forward, they stop, and without turning around dart suddenly backward, thus forward and back as if executing the movements of a quadrille. Remaining motionless a long time, they dart suddenly forward "like an arrow," "spin around like a top," and swim like a fish. It is almost impossible not to think of them as possessed of consciousness, and having a good time. Dr. Kedzie, describing a drop of water full of bacteria, said that it looked like an "animated skating rink."

123. Many Different Species Live Together. A A few weeks ago the *Scientific American* printed pictures of 71 different varieties of bacteria found in a glass of beer. About eighteen different species exist normally on the teeth. You will notice some of the bacteria usually found in the saliva in one of the figures in the accompanying diagram. Man's mouth is a regular botanical garden.

Experiments made with the books in the circulating libraries of Dresden show that where the leaves of the book are turned with the dry finger, not many germs are found on microscopical examination, but where the finger is wet many germs are found. All of these happened to be non-pathogenic germs ; but if a child sick with scarlet fever had been reading that book, the disease might have been spread in that way.

Experiments show that the coins and paper currency of Germany are covered with bacteria. In more senses than one it is "filthy lucre." Perhaps your child is carrying in its mouth the penny that has been paid out by a diphtheritic patient.

The germs of consumption have been found in the dried fly specks on the walls of rooms inhabited by consumptive patients ; the flies had eaten the sputa. It is also claimed that the germs of typhoid fever have been carried in this way.

These germs find an entrance to the body through the water we drink and the air we breathe. They abound in crowded rooms. It is these germs, as Tyndall showed, which enable us to see the sunbeam dancing in a darkened room. When people go into a crowded room and breathe through the open mouth, these germs find a ready entrance to the lungs. When you breathe through the nose, the germs may be stopped by the moist nasal passages. Probably a good many people might avoid catching some contagious disease by keeping their mouths shut.

The higher up you go the less the number of germs. Some one has facetiously suggested balloons as a health resort. Between one and two hundred miles out at sea very few germs are to be found, and sea breezes coming over this distance are comparatively free from germs.

Experiments show them to be more abundant in the cities of London and Paris than in the suburbs, and more abundant in the suburbs than in the country.

I have thus spoken of germs in general, because—

124. Those Germs Which Are Hostile to Us come to us in the same manner and under the same guise as our friends. From town to town they go like a conquering army, but unseen. They are the uninvited guests at our banquets, they sparkle in the water we drink, greet us in the letters of our absent friends, and from the person of the pauper infect the millionaire.

We can see the different military tactics of these different germs when we reflect how these germs of erysipelas (referring to diagram) attack only the surface, the germs of cholera the intestines, the germs of scarlet fever come from the flesh dry, those of diphtheria must be dried before they attack us, while those of typhoid fever enter the body wet, just as they come from the infected body.

Without referring at length to the action of the different germs pictured in the diagram, I may illustrate by telling a story. A year ago a man sick with typoid fever went from a railroad construction camp to the city of Iron Mountain, Mich. In a few days he died. The dejections of this patient were not disinfected as they should have been, and the germs found their way into the water supply of Iron Mountain, and there were 350 cases of typhoid fever and 35 deaths. The water supply of Iron Mountain literally swarmed with this foreign army of typhoid germs. A jug of the water used by some of the families sick with the fever was sent to Prof. Vaughan of the University. He inoculated a sterilized meat preparation with this water, and this injected in dogs produced a regular run of typhoid fever, the same as in man, the germs of the disease being found in the intestines after death. The existence of this germ was also proved by microscopical examination and by the potato culture. Here are 35 deaths because of neglect properly to kill the germs which came from the first case. Many other outbreaks might be cited where hundreds of cases have resulted from one.

Not all diseases have been as thoroughly studied as typhoid, and yet we know that they are caused by a specific germ which reproduces after its own kind. In this connection let me tell you another story: Two or three years ago a Pullman car conductor came in contact with the germs of small-pox in his car near Chicago, passed through on the Grand Trunk to Montreal, and was taken sick with the disease. No pains were taken to kill the germs, the ignorant inhabitants refused to vaccinate, declaring it a "wicked attempt to thwart the will of the Almighty," and in a few months over 3,000 people in Montreal died of small-pox as a result of the one case.

It was carried to different parts of the United States. Michigan, the most exposed of any State, escaped, because Michigan had at her great ports inspectors of travel who vaccinated all who came through and disinfected all clothing, thus killing the germs.

Every week reports are received at the office of the State Board of Health, where outbreaks of diphtheria and scarlet fever have been traced, beyond a doubt, to the germs from a previous case, from letters or clothing. In 1874 there was a case of scarlet fever in a house near Laingsburg. The curtains that hung in the room, the doll with which the child played, and some other articles were packed away in the garret. Five or six years later another family moved into the house and cleaned out the garret. Part of the stuff was burned, but the girl took the doll with which the sick child played, and the two boys took the pictures. In ten days the three children were sick with scarlet fever.

These little invisible enemies of man understand military manœuvres of which the Napoleons of the world never dreamed. They find a hiding place in our garrets and our wells, lurk in the rubbish of our cellars, linger in our hair and clothing, cling to our beds, our carpets, and our walls, are brought to us long distances by letters from our friends. More ingenious than the famous Greek horse, they steal in with the family cat and come with the flies. They congregate in poorly ventilated churches, greet us in the kisses of our friends, and from the coffin of the mother attack the cradle of the babe.

125. How to Destroy the Germs. At last science has begun to see that there is a nobler course than to wait for an attack of these germs and hope that they may be repulsed. The medical profession has sent along its picket line of health officers into the enemy's camp. All honor to those who stay behind to care for the wounded, but aggressive action must take the place of defensive action; prevention must take the place of cure. When we have found a germ, we must find its germicide. We must kill these germs before they attack us. It is easier. You have probably heard of the Irishman who swallowed a potato-bug, and then swallowed Paris green to kill it! That is like trying to blow up a foreign army after it has entered our gates.

What shall we do to be saved from these germs? There are many interesting questions in this connection, which I have not time to discuss. For example, it has been thought by some that these germs can be made to destroy each other. It is known that there are some germs that are not dangerous to man, which eat up germs that are dangerous. The germs of typhoid fever grow faster in water in which there are no other bacteria. Koch found that the cholera bacillus would not thrive in beer; it was destroyed by the other germs. Now some have fancied that every hostile germ has its enemy, which is innocent to man, and that sanitarians may yet make use of these friendly germs.

126. Vaccination. Neither have I time to speak of the great hopes for vaccination in the future. The principle of military strategy here involved is, not to attack the germs, but to strengthen our own fortifications against attack. It is well known that one attack of a disease usually fortifies our body against future attack. Whether the first army forages and devours the food necessary for the support of that kind of germ (Pasteur), or leaves behind some chemical products in which none of their kind can live (Klein and Klebs), or whether, as some claim, the cells have been educated by the first attack so that they better understand the military tactics of this hostile tribe and thus acquire vital resisting power (Sternberg), it is enough to know that a conflict with the weak members of one of these malignant tribes fortifies our bodies just the same as a conflict with the most malignant. Now we can weaken these germs, introduce them into our bodies ; they are easily conquered by the cells, and we are vaccinated. The germs don't lose their nature at all. As some one has said, the rattlesnake has not been changed into a frog ; we have simply extracted some of its poison fangs.

127. **Boil the Drinking Water.** Against those diseases which cause the most deaths in Michigan there is a practical remedy in the hands of every man. I told you how that dread disease, typhoid fever, which kills a thousand citizens of Michigan each year, most of those in the prime of life, is spread by the germs in the water we drink. Now what will destroy these germs ? Freezing the water will not do it, but boiling the water will do it. Robert Elsmere preached a good religion when he preached the necessity of boiling all drinking water. Nothing so easy, nothing so potent. Filtering the water will not destroy these germs. It only takes them prisoners, and when the prison is overcrowded, the filter itself becomes a distributor of germs. Boiling the water one-half hour will destroy them. In view of this fact, some one has declared every death from typhoid fever to be suicide or homicide ; and if there is any one thing I would emphasize to-night, and have remembered when I have done, it is this simple precaution : Boil the water ; boil it when

typhoid fever is prevalent; boil it at the time of year when typhoid is expected; boil it if you have any suspicions about your well; boil it any way. You will hear many precepts at this convention, some, perhaps, which you will forget; but I shall be satisfied if the enthusiasm of this convention reaches the boiling point.

The germs of these other diseases, diphtheria and scarlet fever, enter the lungs through the air we breathe. What will destroy these germs? You may have heard of many disinfectants, but experience in this State has proved that the

128. Fumes of Burning Sulphur will Destroy These Germs. You will find it demonstrated in the reports of the Michigan State Board of Health, that, during the last two years, hundreds of lives have been saved by isolating those sick with diphtheria and scarlet fever, and then, after death or recovery, burning sulphur to destroy the army of germs hiding in the house. Sulphur has long been a good orthodox disinfectant for the next world; we now know that it destroys the little devils in this.

It was an old idea that disease was caused by the possession of devils, and that the way to cure disease was to cast these evil spirits out. Our forefathers used to prick the affected part in the hopes of thus letting the evil spirit out, in much the same way that the Indian medicine men now gather about a patient, one playing the tom-tom to scare the devil out, another jumping on the patient's stomach to stamp the devil out. If the devil doesn't kill the patient, the doctor usually does. Now disease is caused by the possession of evil spirits—devils; but, strange as it may sound, devils that can't live where sulphur is burning.

Such is the foe with which we have to deal. This army of disease germs is the "enemy at our gates." We spend thousands of dollars to maintain a large standing army to protect us against those foreign foes with whom we ought to be at peace. We pay our health officers about enough to keep them in sulphur and boiled water. But of our Michigan boys who enlisted in the Union army during the late war, disease carried off four times as many as the fields of battle and the wounds of battle. In the Crimean war 20,000 French soldiers died in battle, 75,000 died of disease. Those great plagues of the Middle Ages, which swept over Europe like the barbarous Huns and Tartars, caused more deaths in a single year than all the wars of the century.

Like the human race, disease seems to have its home in the East, and take its march of empire westward. Like an invading army, small-pox came to Germany in 1493; to America in 1527. The cholera germs first came here in 1832, and then died out—something like the French soldiers who were unable to endure the climate of Algiers. In India these germs do not die, and every year we fear an invasion. If all the forces of civilization could be gathered here, if once we could kill all the cholera germs in Calcutta, why shouldn't the future Crecy classify this among the fifteen decisive battles of history?

Too often we turn over our mortality statistics and read in the newspapers of so many deaths in such a place, with no other emotion than we experience while reading the market price of our products. But if, as Byron said, it is a

> "Dreadful thing to see the human soul take wing—
> In any form, or any way,"

it is sad to know that over one-fourth of all the deaths which occur in this State are from diseases which we know enough to prevent, but do not. Not long ago, in one of your neighboring towns, there were six deaths from diphtheria in one family in one week, every one of which might have been prevented had every officer done his duty.

On the cars to this convention, whose object is to save human life, I thought of Dickens's beautiful description of the engine which carried away Mr. Dombey after the death of little Paul, and how to him that great iron monster, "defiant of all paths and dragging behind it human beings of all ages and classes, seemed like the type of the triumphant monster Death."

"Away with a shriek and a roar and a rattle—'mid objects close at hand and almost in the grasp, yet ever flying from the traveler," "with a shrill yell of exultation, pausing for a minute where a crowd of faces are that in a minute more are not." "Away with a shriek and a roar and a rattle, leaving no trace behind but dust and vapor—like as in the track of the remorseless monster Death!" "Away, and still away—onward and onward ever, glimpses of cottage homes, mansions and rich estates that look deserted now as they are left behind, and what else are there but such glimpses in the track of the indomitable monster Death!"

The duty of the State to prevent disease and death! Think of those who, in the prime of life, are ground beneath the iron wheel of this remorseless monster!" Think of the young, the innocent, who are made wrecks for life! Think of a Proctor in the full brightness of his intellectual manhood, cut down by a disease which should be one of the accidents of civilization—and then say, if you will, that the saving of human life is not the first and the highest duty of the State.

DISEASES OF DOMESTIC ANIMALS.*

129. Diseases of Cattle. Of this class *malignant catarrh* is probably the most common. It is not well understood, and is often called by other names. To enable chairmen and members of Boards of Health, as well as intelligent owners of cattle, to have clearer ideas on this important subject, we submit the description given by Prof. Jas. Law, one of the best authorities in this country:

"This appears mainly in cold, damp, marshy situations where the vitality is impaired, or in unusual seasons. In the cold, early summer of 1875 I met with it in cows in several marshy places. Low, damp river bottoms are most subject to it, and probably it is due to deleterious agents taken in with the food and water as well as to chills and exposure.

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* Report State Board Health Minnesota, September, 1889.

"130. **Symptoms.** A slight diarrhœa may be followed by costiveness, the dung being black, firm and scanty. The hair is rough and erect, shivering ensues, the head is depressed, the roots of the horns and forehead hot, eyes sunken, red, watery, with turbidity in the interior, and intolerance of light, muzzle dry and hot, mouth hot with much saliva, the membranes of mouth, nose and vagina bluish-red, pulse rapid, impulse of heart weak, breathing hurried, cough, urine scanty and high-colored and surface of the body alternately hot and cold. In twenty-four hours all the symptoms are aggravated, the nose discharges a slimy fluid, the forehead is warmer, and duller on percussion, the mouth covered with dark-red blotches from which the cuticle soon peels off leaving raw sores, appetite is completely lost, dung and urine passed with much pain and straining, and there is general stiffness and indisposition to move. From the fourth to the sixth day ulcers appear on the nose and muzzle, swellings take place beneath the jaws, chest and abdomen, and on the legs the skin may even slough off in patches, a fœtid saliva drivels from the mouth, and a stinking diarrhœa succeeds the costiveness. Death usually ensues from the eighth to the tenth day, preceded, perhaps, by convulsions or signs of suffocation. The disease strongly resembles the *Russian cattle plague;* but is rarely contagious.

"131. **Treatment.** Clear out the bowels by a laxative (olive oil and laudanum), following this up by slightly stimulating diuretics (sweet spirits of nitre, liquor of acetate of ammonia), with antiseptics (chlorate of potassa, bichromate of potassa, hydrochloric acid). Wet cloths may be kept on the head, the mouth and nose sponged with very weak solutions of carbolic acid, and only soft mashes and sliced or pulped roots allowed."

Prof. Law visited on two occasions with the Secretary herds in which cattle had died of this disease. The characteristic symptoms there "were the case with which the horns were detached when pulled, the sudden onset of chills, redness of all the mucous membranes, muscular weakness, and death in convulsions." Post-mortem examination showed the cause of death to be the inflammatory condition of all the cavities in the nose and frontal bone, which, in rapid cases, were full of a gelatinous pink fluid which, in the bone under the horns, was sufficient to detach them, and they came off quite easily. Prof. Law's suggestion as to the probable cause—low pastures on waterlogged soil, with stagnant water to drink—furnishes the key to the disease and suggests the remedy.

132. Black Leg. As has been repeatedly stated before, in these notes, a great variety of affections are reported under this name. The most common in Minnesota has been *black quarter*. It occurs in young and healthy stock, probably overfed, and subjected to close confinement, with sudden exposure, as going from warm barn to ice-covered pond to drink, for example. It has been rapidly fatal, and the first symptoms have usually been fever, lameness in one leg, hip or shoulder, extreme tenderness just under the skin, with local swelling. Death usually comes rapidly. The animal is helpless, becomes dull, skin over the swollen part is tense, hard, cold and insensible, blood often is effused, and the end comes quickly. Post-mortem shows the affected part to be distended with gelatinous fluid, more or less bloody—blood is found, semi-fluid and diffused through all the affected tissues. Medicine of little use; but the disease may be fore-fended by reducing the food of the rest of herd, giving bran mashes, linseed oil if the bowels are constipated, fresh cool, not cold, air, and exercise. In both these affections, isolate the sick from the well, look carefully for anything wrong in food, drink or care, and report the facts through your local Board of Health.

133. Tuberculosis—(Consumption, Wasting, Scrofula, Pining). This disease is not only fatal to cattle, as were the other diseases we have referred to, but it is of much greater importance as it affects the milch cow, and its victims are very likely to be sent to the butcher. It is communicable by the milk or flesh of its victims, and so is of the greatest importance as affecting the value and healthfulness of important foods, milk and beef. As to its probable prevalence in this State, we have, as yet, no reliable data, though we shall take steps to that end as soon as possible. Prof. Law telegraphed the writer last winter that in his large experience, he "had seen thirty, fifty, and even eighty per cent. in some dairy herds;" and Dr. Salmon, Chief of the Bureau of Animal Industry, replied: "It is generally admitted that milch cows are mostly affected, thoroughbred breeding stock next, and native steers least."

Prof. Law's description of this disease is the most simple and least technical we know, so we quote it:

"This is a specific bacteridian affection, due to a bacillus, and characterized by a specific deposit of cells, large and small, in a special network, but without blood vessels. It is situated by preference in the groups of lymphatic glands, or in the microscopic gland-like tissue of the different organs, and may be seen in all stages, from the simple redness and congestion in which the deposit is only commencing, through the solid grayish tubercle to the soft yellowish cheese-like mass resulting from the softening of the latter. There are also the cavities (*vomicæ*) resulting from their rupture and discharge of the tuberculous matter, and chalky masses from the deposit of earthy salts within them. They may be no larger individually than a millet seed (miliary tuberculosis), or in the chest of cattle one may measure a foot long and five or six inches in thickness. They are most common in cattle, especially heavy milkers, with long legs, narrow chest, attenuated neck and ears, and horns set near together. Fowls and swine with a corresponding conformation, are next in order of liability, while horses, dogs and sheep are comparatively exempt. Oft-repeated experiment has shown that tubercle is communicable to healthy animals by inoculation, or by eating the raw, diseased product, and that it is superinduced in any predisposed individual by setting up a local inflammation. It has also been transmitted by the warm, fresh milk; but probably only when the disease has invaded the mammary glands; in many experiments, including those conducted by the author, the milk has proved harmless. Close, badly-aired buildings, (as town cow sheds), are among the most prolific causes of the disease, as are also changes to a colder climate, to a cold, exposed locality, or from a dry to a low, damp, undrained region. Finally, any cause which tends to wear out the general health tends to tuberculosis in a predisposed subject.

"Tubercles may be developed in any part of the body, as the lungs, their serious covering, the membrane supporting the bowels, the coats of the intestines, the throat, the spleen, the liver, the pancreas, the ovaries, the kidneys, the bones, especially the ends of long bones, and in rare cases, the muscles and connective tissue.

134. Symptoms vary according to the seat of the deposit, yet there is a constitutional condition common to all, and the lungs are almost always involved in the later stages, giving rise to a great similarity of symptoms. The disease may be acute; but is usually chronic. The onset is insidious, and easily overlooked, tubercles being often found in animals killed in prime condition, and I have seen them in *parturition fever*, which is always attributed to plethora. There is some dullness, loss of vivacity, tenderness of the withers, back, and loins, and of the walls of the chest, occasional dryness of the nose, heat of the horns and ears, want of pliancy in the skin, slightly increased temperature (102°), weak, accelerated pulse, mawkish breath, stiffness of the limbs, wandering perhaps from one to another, slight, infrequent, dry cough, and blue, watery milk, often abundant but with cheesy matter, fat, and sugar decreased and soda and potassa in excess. The lymphatic glands about the throat are often manifestly enlarged. Swellings of the joints may appear, or a murmur harsher than natural may be heard over the lower end of the windpipe or in the chest. With deposits in the abdomen, and especially in or near the ovaries of cows the desire for the male is often constant (*bullers*), though conception and the completion of gestation are usually impossible. Working oxen are easily overdone, and become visibly emaciated from day to day. As the disease advances the eyes sink in their sockets and lose all animation, the skin is hidebound, harsh, dry, and scurfy, the hair dull, dry and erect, the membranes of the eyes, nose and mouth of a pale, yellow, bloodless aspect, though often streaked with pink vessels, a whitish discharge often takes place from the nose, and with it an increased repulsiveness and often distinct fœtor of the breath ; if the bowels are involved scouring is common, and if the bones, swelling and lameness increase. Exhaustion with profuse perspiration and labored breathing occur on the slightest exertion, the appetite fails, tympany follows each meal, and the milk is at once poorer and lessened in quantity. The cough increases, becomes rattling, the discharge profuse, fetid, mixed with cheesy-like or chalky particles, crepitating, wheezing, gurgling, and other abnormal noises are heard in the chest, and percussion shows dullness in particular parts with winching. All of the symptoms become steadily aggravated, and the animal usually perishes from the difficulty of respiration or the profuse fetid diarrhœa. In cases affecting the bones, the patient may be unable to stand, and the bony prominence may make their way through the skin or even crumble under the pressure thrown upon them. If the tubercle is deposited in liver, pancreas, or kidneys, there are symptoms of disease of these respective organs.

"135. **Prevention.** This would include drainage, shelter of pastures by trees, avoidance of changes to cold or damp localities, a warm, sunny location for farm buildings, suitable feeding and watering, the prevention and cure of all debilitating, and especially chronic diseases, protection against overwork, or excessive secretion of milk on a stimulating but insufficiently nutritious diet, securing young, undeveloped animals against breeding and milking at the same time, rejection of tuberculous subjects from breeding, the prompt removal of all such animals from pastures or buildings used for the healthy, and the thorough disinfection of all places where they have been kept.

"The flesh and milk of tuberculous animals are always to be viewed with suspicion; but this poison, like others, can be destroyed by the most thorough cooking."

PART VI.

CIRCULARS ISSUED BY THE STATE BOARD OF HEALTH.

No. 1.

136. Rules for Health.

1. Cleanliness.—Wash the whole body daily, the first thing in the morning, with cold or tepid water, and rub with a rough towel. Wash hands before meals, and on coming home from work. If your work is dirty, or lies among poisonous substances, use a nail brush. Use soap freely. No one can keep sweet and well whose skin is clogged with dirt and perspiration. Use a tooth brush night and morning.

2. Temperance.—Avoid drinking beer or spirits between meals. Strong liquors always do most harm on an empty stomach. If you have been giving way to drink, take the pledge of total abstinence. It will be easier for you, in that case, to take nothing than to take a little. You will find tea, coffee or cocoa better to work on, and more warming, than either beer or spirits, even at hard work like harvesting, or exposure to rain or cold.

3. Puirty of Air.—Keep your bed-room from being close and stifling. If you have no ventilator, keep an inch of window open (unless the weather be *very* cold), or bore four or five holes in the bottom and top of your door. Unless you do this you will be breathing again and again air which you or others have breathed before, and which is therefore spoiled. Open your doors and windows wide, when you rise, and so air your bed and bedclothes well.

4. Drains.—Look sharp after all drains, sinks, closets and cesspools in your house. Keep them in good working order, and flush the drains once a week. Cisterns

should be carefully covered to keep out dust, and two or three times a year should be emptied and thoroughly cleansed. If there is a bad smell get some carbolic acid, chloride of lime, copperas, permanganate of potash, or other disinfectant (all to be had at any druggist), mix with water according to the directions given with each, and use it till you have got rid of the evil. A foul smell is nature's warning against the poison that causes typhoid fever and diphtheria, and makes all other diseases more dangerous and difficult to cure.

5. THRIFT.—Economy goes so closely together with healthy habits of mind and body that I cannot pass it over here. Don't spend all you earn as fast as it comes in in beer, or tobacco, or finery. Put some into coal and clothing, savings banks, benefit societies, or the like. Be ashamed of begging, and do not borrow, except under the pressure of sickness or misfortune.

6. MEDICINES.—If you feel really ill go to a doctor, or hospital, or dispensary, instead of drugging yourself with patent medicines. You can never trust the advertisements that puff them. You are not a good judge of the nature or cause of your illness. Even if they have done good to others, you cannot tell whether they will do good to you. You don't know what they are made of, and the very fact that the proprietors make a secret of it shows that they prefer large profits to doing good. In nine cases out of ten you will pay much more for them than for medicine in the regular way.

No. 2.

137. Rules for Infectious Sickness. 1. Separate the sick person from the rest of the family, and if possible put him in a top room. Remove carpets and curtains, keep a fire in the room, or open the window, or both, according to weather. Swing the door, on its hinges, backward and forward, several times a day. Ventilate the whole house freely.

2. In case of sickness or other discharges, use vessels containing two tablespoonfuls of chloride of lime mixed

with one pint of water, or a strong solution of copperas. Use the same liquid for whatever requires cleansing. Wash all the cups and glasses used by the sick person, and be more careful than ever as to the health rules. If the air of the room is offensive burn a piece of coarse brown paper, previously dipped in a strong solution of saltpetre.

3. Keep every one but the nurse and doctor, as far as possible, out of the room, and let the nurse wear an apron in the room, and when she goes out to her meals, take it off, and wash her hands and face.

4. Soak all linen used by the patient in water in which chloride of lime has been dissolved in the proportion of a tablespoonful to a quart, or use some other disinfectant, as in health rule No. 4, and then wash as usual. Get carbolic soap and use it in washing the patient's body, especially when he is beginning to recover. When he leaves the room, fumigate it with sulphur, and mop ceilings and walls with carbolic acid powder.

5. If death ensues, avoid bringing people in (especially children) to see the body. Sprinkle carbolic acid or charcoal powder over the corpse, and inter as soon as possible.

6. In any case of illness likely to prove infectious, consult a doctor as soon as you can, and act strictly as he orders.

7. Should small-pox be in your neighborhood, get yourselves and your families revaccinated. Don't believe those who tell you that you are safer and better without it. As for not having your children vaccinated, that, you know, is criminal, and ought to be punished by fine or imprisonment.

8. Remember, also, that it is a punishable offence to take any person in a state likely to spread infection into a railway carriage or other public conveyance. The Legislature has rightly protected the healthy against the criminal selfishness or carelessness shown in such conduct.

No. 3.

138. Approved Disinfectants. The object of disinfection is to prevent the extension of infectious diseases by destroying the specific infectious material which give rise to them. This is accomplished by the use of disinfectants.

The disinfectants recommended by the American Public Health Association are the following: A solution of chloride of lime (bleaching powder) made by dissolving four ounces of chloride of lime of the best quality in one gallon of water. This is known as standard solution No. 1, and is especially recommended for the disinfection of the excreta of cholera, typhoid fever, probably epidemic dysentery and tuberculosis, and perhaps diphtheria, yellow fever and scarlet fever at least ten minutes before throwing them into the privy vault or water closet, about a pint to each discharge. Standard solution No. 2 is composed of two drachms each of corrosive sublimate and permanganate of potash to one gallon of water. This may be used for the same purposes as standard solution No. 1, but it should be allowed to remain longer in contact with the material to be disinfected. It is to be borne in mind that standard solution No. 2 is highly poisonous. It also injures lead pipes if passed through them. Hence it cannot be used in water closets in which lead-pipe connections are employed.

For cleansing the surface of the body of a sick person or of his attendants, when soiled with infectious discharges, a solution of one part of Labarraque's solution in five parts of water should be used. This is denominated standard solution No. 3. Care should be taken to secure a good preparation of Labarraque's solution, which varies very much in strength. It should contain at least three per cent. of available chlorine.

Clothing can be best disinfected by boiling for at least half an hour. Boiling for this length of time will entirely destroy all disease germs. If the infected clothing cannot be at once thoroughly boiled, it should be immersed in a solution made by adding one gallon of the above-named standard solution No. 1 to nine gallons of water, or in a dilution of standard solution No. 4, made by adding four ounces of corrosive sublimate and one drachm of permanganate of potash to one gallon of water. Of this latter one fluid ounce should be added to each gallon of water to make a disinfectant of proper strength for infected clothing.

Clothing which cannot be washed may be disinfected by exposure to dry heat in a properly constructed disinfecting chamber for three or four hours. A temperature of 230° Fah. should be maintained during this time, and the clothing must be freely exposed—*i. e.*, not folded or arranged in piles or bundles—for the penetrating power of dry heat is very slight.

In the sick room no disinfectant can take the place of free ventilation and cleanliness. It is an axiom in sanitary science that it is impracticable to disinfect an occupied apartment, for the reason that disease germs are not destroyed by the presence in the atmosphere of any known disinfectant in respirable quantity.

The use of fumigation with sulphurous acid gas alone to the exclusion of other measures of disinfection is not regarded by the committee as a reliable disinfectant for the contents of the sick chamber, such as bedding, furniture and infected clothing. It is believed that its value has been very much overestimated by the public and by health officials.

Privy vaults and cesspools which have become infected by having the excreta of patients sick with cholera or typhoid fever thrown into them before disinfection must be disinfected as soon as the fact is discovered, or whenever there is reasonable suspicion that such is the case. The following measures should be used to accomplish this purpose:

Use one pound of corrosive sublimate for every five hundred pounds—estimated—of fecal matter contained in the vault, or one pound of chloride of lime to every thirty pounds. Standard solution No. 4, diluted with three parts of water, may be used. It should be applied—the diluted solution—in the proportion of one gallon to every four gallons—estimated—of the contents of the vault. If chloride of lime is to be used, one gallon of standard solution No. 1 will be required for every gallon—estimated—of the material to be disinfected. All exposed portions of the vault and the wood-work above it should be thoroughly washed down with the disinfecting solution. To keep a privy vault disinfected during the progress of an epidemic, sprinke chloride of lime freely over the surface of its contents daily. Or, if the odor of the lime is objectionable, apply daily four or five gallons of standard solution No. 2, which should be made up by the barrel and kept in a convenient location for this purpose.

No. 4.

139. To the Physicians of Maryland.

MARYLAND STATE BOARD OF HEALTH.
SECRETARY'S OFFICE,
BALTIMORE, August 6th, 1889.

In order to secure the highest degree of sanitation practicable, it is important that all practicing physicians throughout the State should co-operate with the local or county health officers. This can be best done by reporting immediately to the county health officer all cases of infectious or contagious diseases which may occur in their respective localities, noting particularly deaths from such diseases.

The lines of duty along which physicians may render themselves most useful to the public, may be said to be three-fold. In the first place they are in a position to act as educators, or leaders in local sanitary work; and since we can hope for no satisfactory progress without enlisting the interests of the people generally, it is altogether desirable that physicians should turn their attention to this part of the work also.

In the second place, physicians stand as arbiters between the thoughtless and willful committers of nuisances and their unfortunate neighbors, who are unpleasantly and injuriously affected by their doings. In most instances the family physician can induce the abatement of such nuisances, without resort to the local Board of Health, but should he fail to do so, immediate notice should be given the county health officer, whose duty it will be to investigate the matter and report thereon to either the State or county health board, as he may deem proper.

A third work in which physicians can essentially aid, is the prevention or restriction of infectious or contagious diseases. Knowing as we do the possibility of limiting the spread of such diseases by means of well directed and united efforts, their prevalence and their ravages are in a great part entirely needless, if proper precautions are taken against diffusion. First cases should always be reported *at once* to the local or county health officer, who in turn will report the facts to the State Board of Health, for such action as may be deemed necessary in the premises.

In no direction is there a more serious responsibility than as regards certain contingencies due to the presence of infections; and the man or woman who willfully or carelessly subjects his neighbor to the danger of disease and death is no less a criminal than he who uses nitro-glycerine to send his victims to their final account.

C. W. CHANCELLOR, M. D.
Secretary and Executive Officer.

No. 5.

140. Rules for the Guidance of Local Health Officers. In addition to the specific duties imposed upon Local Health Officers under Sections 6 and 7, Chapter 22 of the Laws of 1886, to which attention is especially called, the following is published for the information and guidance of all concerned:

1. Local Health Officers should inform themselves,

as far as practicable, respecting all influences affecting or threatening to affect injuriously the public health within their respective counties or districts ; noting particularly all sources of pollution to streams, wells or springs from which water is drawn for drinking or culinary purposes.

2. They should inquire into and ascertain, by such means as are at their disposal, the cause, origin and distribution of diseases within their respective sanitary jurisdictions, and ascertain to what extent the same have depended on conditions capable of removal or mitigation.

3. They should, by systematic inspection of their respective counties, at certain periods or intervals as occasion may require, keep themselves informed of the conditions injurious to health which may exist therein.

4. They should advise the State Board of Health of all matters affecting the health of their respective counties, or any locality therein, as a basis for sanitary aid or legal action on the part of said Board.

5. On receiving information of the outbreak of any contagious, infectious or epidemic disease of a dangerous character within their sanitary jurisdictions, they should visit the locality without delay, and inquire into the causes and circumstances of such outbreak, and give immediate information to the State Board of Health in reference thereto.

6. They should give information to the State Board of Health of the existence in their respective counties of any nuisance injurious to health, where the aid of the said Board may be required to abate the same.

7. They should inquire into any offensive process of trade carried on in any district of their respective counties, and take all necessary steps for the prevention of nuisance or injury to health therefrom.

8. If for any reason the report required by Section 6, Chapter 22 of the Laws of 1886 cannot be completed by the end of October, it should be understood that the delay must not be indefinite, and that the report, com-

plete or incomplete, should be in the hands of the Secretary of the State Board of Health within, at furthest, two weeks from the 31st of October. In all cases in which the report cannot be sent within that time, the State Board should be informed as to the reason of the delay.

C. W. Chancellor, M. D.,
Secretary and Executive Officer.

No. 6.

141. How to Prevent Scarlet Fever from Spreading. As there is no doubt that the scarlatinal poison is given off from the body, not only during the time the eruption is out, but until the peeling of the skin has ceased, great care should be used to render harmless everything that can aid as a poison carrier, as soon as, and whenever possible, before it is thrown off from the body; and this may be effected by observing the following precautions:

1. All needless woollen or other draperies should be removed from the room in which the patient lies, and immediately disinfected if the rash has appeared.

2. All discharges from the patient should be received in vessels in which carbolic acid, chloride of lime, or other disinfectant, is constantly kept.

3. All bed and body linen should be plunged into water, containing a disinfectant, *immediately* it is taken from the patient, and *before* it is taken from the room.

4. Pocket-handkerchiefs should not be used, but small pieces of rag, which should be burnt directly.

5. Nurses and others, whose hands come in contact with the patient, should wash them in water containing chloride of lime, a quarter of a pound to a gallon of water; sulphate of iron (copperas), a pound to a gallon of water; or other disinfectants, and afterwards in plain soap and water. The person in charge of the sick should not mix with the rest of the family, and should wear dresses made of washing materials.

6. All glasses, cups, etc., used by the patient, should be carefully cleaned in boiling water before being used by other persons.

7. The sick room should be kept well ventilated; the lower sash may be raised two or three inches, and a piece of wood be placed underneath, so as to close the whole of the opening, and thus allow of ventilation above the meeting bar of the lower sash.

8. The bed, mattress and woollen articles which have been used by the patient or exposed to the infection, should be disinfected in the following manner, as soon as the patient is convalescent: The bed and mattresses should be taken off the bedstead, and the latter, if iron, removed from the room, after being well washed with disinfecting soap; the mattresses should be placed on end, the woollen articles spread on chairs, chimney and windows closed, and the room disinfected with sulphur, by throwing from a quarter to half a pound of sulphur on some red hot cinders in an earthenware pan, which has been previously placed on a brick in a larger pan partly filled with water. The door should be immediately shut, and kept so for twelve hours, after which the windows should be opened. The person that goes into the room to open the windows should first cover the mouth and nose with a handkerchief moistened with water.

9. The room in which the patient has been should never be again occupied or let afresh until it has been disinfected with sulphur in the manner above described and been thoroughly cleansed and the paper stripped off.

By careful attention to these directions the chance of the infection spreading, from the discharges of the patient, is greatly lessened.

Danger is created by the minute size of the infectious matters, as the skin peels off either in flakes, or almost like dust, which floats in the air without being seen. *Each of these little atoms may cause scarlet fever.* While they are on the body they may be readily rendered harmless; but once afloat in the air, they are in great degree beyond our power.

The first thing to aim at is, to prevent these minute particles like dust, which are carriers of the poison, from getting away before they are disinfected. This can be readily effected by simply anointing the surface of the body, scalp included, twice a day with olive oil. The oil may be slightly impregnated with camphor, as it assists in relieving the itching and helps on convalescence. As early as the fourth day of the eruption, white scales may often be observed on the skin of the neck and arms, which should be the signal for the first employment of the oil. From this time, the oiling should be continued until the patient is well enough to take a warm bath, in which the whole person—scalp again included—should be well scrubbed, disinfecting soap, such as carbolic soap, being abundantly used during the process. These baths should be repeated every other day, with the continued use of disinfecting soap, until four have been taken, when, as far as the skin is concerned, the disinfection may be regarded as complete, unless the peeling should continue after this time, in which case the baths should be taken until the peeling has ceased.

When the health is quite recovered—if, in particular, there be no disease of kidney and no discharge from throat and nostril—the patient, clothed in a new or perfectly clean suit may, generally, be restored without risk to his family. A week or ten days' additional delay is, however, perhaps more prudent, or indeed as long as any peeling of the skin continues, because the patient may infect other persons, until the skin has become quite healthy.

N. B.—Scarlatina is the same disease as scarlet fever, being only another name for it.

No. 7.

142. Precautions to be Adopted for the Prevention of the Spread of Measles in Schools. 1. A suspected case, as, for instance, one of persistent sneezing or watering of the eyes, when measles is known to be prevalent in the neighborhood, should be isolated at once.

2. If it turns out to be measles, any other suspected case should be isolated, and the school-room in which the case occurs should be disinfected.

3. Other children from the house in which the case occurred should not be received into the school, as they carry the poison in their clothes.

4. Measles is contagious at so early a period that such measures often necessarily fail from the precautions not having been taken soon enough.

5. Fourteen days after the eruption has disappeared is a proper interval to allow before the return of a child to school.

6. The disinfection mentioned should be carried on as follows : Spread out and hang upon lines all articles of clothing and bedding ; well close the fireplace, windows, and all openings ; then take a quarter to half a pound of brimstone, broken into small pieces, put them into an iron dish, supported over a pail of water, and set fire to the brimstone by putting some live coals upon it. Close the door, and stop all crevices, and allow the room to remain shut up for twenty-four hours. The room should then be freely ventilated, by opening the door and windows ; the ceiling should be whitewashed, the paper stripped from the walls and burnt, and the furniture and all wood and painted work be well washed with soap and water, containing a little chloride of lime. Beds, mattresses, and articles which cannot well be washed, should, if possible, be submitted to the action of heat in a disinfecting chamber. Until this process of disinfection is carried out, the rooms cannot safely be occupied. For large rooms, about a quarter of a pound of sulphur should be allowed to each 1,500 cubic feet of air, and it should be burned in several vessels, placed at different parts of the room, and not all in one large vessel.

No. 8.

143. Typhoid or Drain Fever and how to Prevent it. This fever has been called *drain fever,* from its frequent association with bad and imperfect drainage in houses. At one time it was confounded with typhus fever ; hence its name *typhoid,* but it is now known to be quite a distinct disease. It is also often spoken of as *low fever,* from the great exhaustion and weakness which attends it. It is a highly contagious fever.

The means by which this disease may largely be prevented from spreading are very simple, and depend upon the fact that the poison by which it spreads is to a great extent contained in the discharges from the bowels. Dr. W. Budd gives the following excellent directions for preventing the spread of this disease. He says the discharges from the bowels infect—

1. The air of the sick-room.
2. The bed and body linen of the patient.
3. The privy and the cesspool, or the drains proceeding from them.

From the privy or the drain, the poison often soaks into the well, and infects the drinking water. This last, when it happens, is of all forms of fever-poisoning the most deadly. In these various ways, the infection proceeding from the bowel-discharges often spreads the fever far and wide. The one great thing to aim at, therefore, is to disinfect these discharges on their very escape from the body, and before they are carried from the sick-room. This may be perfectly done by the use of disinfectants. One of the most convenient is made of green copperas. This substance is very cheap, and may be had everywhere. A pound and a half of green copperas to a gallon of water is the proper strength. A teacupful of this liquid, put into the nightpan every time before it is used by the patient, renders the bowel-discharge perfectly harmless. To disinfect the bed and body linen, and bedding generally, standard solution No. 1 (see approved disinfectants), diluted with nine gallons of water. This should be sprinkled on soiled spots of the linen, and about the room, to purify the air. All articles of bed and body linen should be plunged, immediately on their removal from the bed, into a bucket of water containing a teaspoonful of chloride of lime, and should be boiled before being washed. The privy, or closet, and all drains communicating with it, should be flushed twice daily with the green copperas liquid or carbolic acid, diluted with water. In the event of death the body should be placed as soon as possible in a coffin surrounded with charcoal, sprinkled with disinfectants. Early burial is, on all accounts, desirable. In towns and villages where the fever is already prevalent, the last rule should be put in force for all houses, whether there be fever in them or not, and for all public drains. As the hands of those attending on the sick often become unavoidably soiled by the discharges from the bowels, they should be frequently washed. The sick-room should be kept well ventilated, day and night. The greatest possible care should be taken with regard to the drinking water. Where there is the slightest risk of its having become tainted with fever-poison, water should be got from a pure source, or should at least be boiled before being drunk. Immediately after the illness is over, whether ending in death or recovery, the dresses worn by the nurses should be washed or destroyed, and the bed and room occupied by the sick should be thoroughly disinfected. These are golden rules. Where they are neglected, the fever may become a deadly scourge. Where they are strictly carried out, it seldom spreads beyond the person first attacked. A yard of thin wide-width gutta percha placed under the blanket, under the breech of the patient, by effectually preventing the discharges from soaking into the bed, is a great additional safeguard.

No. 9.

144. **Prevention of Diphtheria.** Diphtheria is a preventable disease. Its existence depends on conditions that can generally be controlled. It may appear in any

community, but it should not be allowed to develop beyond the first case or cases that make their appearance.

CONDITIONS ON WHICH IT DEPENDS.

Diphtheria probably always originates from a special poison which develops in the person sick with it. This special poison is given off in the breath, in the discharges from the mouth, throat and nose, and in some degree in those from the bowels and bladder.

The virus has the property of *adhering tenaciously to objects* on which it happens to alight. By reason of this, the sick-room, its floor, walls, furniture, and all contents, become infected with the disease, and continue to be so until the virus is destroyed by cleansing and fumigation.

The disease may also be carried away by any article coming in contact with the sick, and to which the virus clings, by the clothing, bedding, eating utensils, food, toys, and also by the persons and clothing of those in attendance upon the patient.

Another important fact is that the *virus is very long lived;* articles and premises infected with it may communicate the disease for at least several weeks; it may be transported by them with great facility and to an indefinite distance.

A final important point is, that *bad sanitary conditions favor the development and propagation of the diphtheritic virus.* It grows best in places that are damp and foul and ill-ventilated; in cellars moist by imperfect drainage, and defiled by uncleanly accumulations in the soil about it; in damp, unventilated spaces under floors; in cesspools, drains and sewers, or any place where there is dampness, filth and imperfect access of fresh air. In large cities, the sewers furnish so favorable a place for the growth of this virus when it gets into them, and its vitality is so great under such surroundings that their infection may become permanent; no similar conditions, however, need exist in small localities.

Diphtheria is contracted by inhalation of air containing the disease germs coming directly from the sick, or from articles infected by them. It is also communicated by articles passing from mouth to mouth, such as cups, spoons and toys. The articles by which it is communicated may have become infected weeks before, and, possibly, at some locality quite remote. It is contracted by inhaling the air of sewers, cesspools, cellars, or any damp, foul or ill ventilated place in which the disease germs chance to have become planted. Children contract diphtheria much more readily than adults.

SUPPRESSION OF DIPHTHERIA.

Every locality is liable to have diphtheria brought into it. It will not continue long if the principal conditions on which its existence mainly depends are removed; if the sick are strictly secluded, the disease germs destroyed, and all unsanitary conditions which favor their continued development removed.

1. *Isolation.* Those sick with diphtheria should be isolated from every one except necessary attendants. This should be done with mild cases as well as severe ones. They should be placed in an upper, airy room, as remote as possible from other living and sleeping rooms. Needless furniture and other articles should be removed from the room. Allow the windows to be open, for the poison does not go far away in the atmosphere; give sunshine and fresh air constantly.

The attendants should remember that they carry with them the poison of the disease, and they must keep entirely away from others, especially from children, who take diphtheria most readily. No article should leave the room without cleansing or disinfection. Utensils used by the sick should be well cleansed before use by others. Food left by them should be destroyed. Bed and body clothing should, before being taken from the room, be placed in disinfectant No. 2, boiling hot if possible. Cats and dogs should be excluded.

The discharges from the mouth and nose must be received on cloths that can be burned, or in cups that can be disinfected. Vessels for receiving the discharges from the mouth, nose, kidneys and bowels should contain some of disinfectant No. 1 or 3, and after use should be cleansed with boiling water.

The patient must not mingle with the well until all traces of the disease have left the throat and nose. Before leaving the sick-room the body should be thoroughly washed, and fresh, uninfected clothing should be put on, leaving every thing else behind to be disinfected. Nurses must observe the same final precautions.

2. *General Precautions.* All should avoid sources of contagion. Well children had better be removed entirely from the house, but should be kept under observation, and if diphtheria develops brought home again so as not to establish a new centre. Persons remaining in the house should not go to school, church or any general gathering, nor to any house where there are young persons. If the disease has secured a foothold in a locality, every case of sore throat should be regarded as suspicious and excluded from schools and from contact with other children. It would be well to make sure that milk is not taken from a dairy where the disease exists.

3. *Sanitary Precautions.* Houses should be kept clean, dry and well ventilated; particular attention should be given to the cellar. Drain pipes and fixtures should be perfect. The premises should be well drained, leeching cesspools and privy vaults removed, all decomposing accumulations of garbage or stable manure cleared away and the place made in every way clean. These precautions are to be especially observed about domiciles where the disease exists. The condition of school-houses should not be overlooked.

4. In case of death the body should be enclosed in a sheet saturated with disinfectant No. 3, placed in a

tight coffin not afterwards opened, and *burial should be private* and with as little delay as possible.

DISINFECTION.

1. *Of the Room.* During its occupancy as a sick-room, the precautions suggested above as to destruction of disease germs attached to articles of any sort before their removal from it should be carefully observed. At the termination of the quarantine the room should be tightly closed and with all its infected contents fumigated with the fumes of burning sulphur or of chlorine, which, especially if the latter is used, should be done only by a competent person. Arrange all the contents of the room so that their surfaces are readily reached by the disinfecting gas. The room should remain closed for twenty-four hours, after which it and its contents should be aired thoroughly for several days. The wood-work should also be thoroughly washed, especially the tops of doors and windows, and solution Nos. 2 or 3 applied. Ceilings should be whitewashed and wall paper removed, and the walls washed with one of the disinfectant solutions.

Sulphur Fumigation. Roll sulphur, in the proportion of two pounds for a room ten feet square, is burned by placing it in an iron kettle, set in a tub containing a little water to guard against fire. It may be ignited by pouring a little alcohol or kerosene on it.

Chlorine Fumigation. Mix well, breaking up all lumps, one part by measure of black oxide of manganese and two of common salt, and add enough water to make of the consistency of cream. A teacupful of this mixture is to be put into a large earthen vessel, as a washbowl, one or two of which may be placed in each room. About an equal bulk of commercial sulphuric acid is to be finally poured into each vessel, beginning with the most remote, the person retiring quickly ; it is best to pour this from a pitcher ; avoid inhaling the fumes by holding a handkerchief over the face.

2. *Of the Premises.* The entire house should be

thoroughly cleansed. The premises also should be cleared of all unsanitary conditions, and all drains, privy vaults and sites of uncleanly accumulations drenched with solution No. 1.

DISINFECTANT SOLUTIONS.

No. 1. Sulphate of iron (copperas), three pounds; warm water, one gallon; for the discharges. This leaves rust spots on clothing.

No. 2. Sulphate of zinc (white vitriol), four ounces; common salt, two ounces; water, one gallon. For clothing.

No. 3. Corrosive sublimate, sixty grains; water, one gallon. Caution should be had of the dangerously poisonous character of this solution; it is well, as a precaution, to color it by adding an equal quantity (sixty grains to the gallon) of permanganate of potash, with which, however, it stains fabrics, etc. To wash furniture and wood-work.

No. 10.

145. Precautions Against Dysentery and Diarrhœa. 1. Every person attacked with looseness of the bowels should at once secure proper medical attendance. Children suffering from diarrhœa should be taken directly to a competent medical man. Purgative medicines should not be given unless ordered by a legally qualified medical practitioner.

2. All sudden checks to perspiration should be avoided, and a flannel shirt and belt should be worn to avoid such a result.

3. All persons should live temperately and regularly on those articles of food which they are used to, and which agree with them. Fish, fruit, and vegetables may be taken with impunity, provided they are sound and free from all taint. All food that is tainted and smells disagreeably should be avoided. Great care should be taken not to give stale, sour, or tainted food to children. Sour or tainted milk is one great source

of diarrhœa in children, and should on no account be given to them. The concentrated milk is a good substitute for common milk where it cannot be got fresh and pure.

4. Intemperance and drunkenness invite attacks of dysentery and fatal diarrhœa. Temperance in eating and drinking is a great safeguard against all fatal diseases of the bowels.

5. It is of the utmost consequence to avoid all foul smells, as of sinks, closets, drains, dust-bins, and the like. It should be remembered that closets and sinks, if not properly constructed and kept clean, will allow foul air to come up by the same channel that water goes down. See, therefore, that all closets and sinks are plentifully supplied with water.

6. One of the greatest sources of health is *fresh air*. The poison of all infectious diseases may be diluted and destroyed by fresh air. Hence the importance of having every room sweet by keeping open the doors and windows, so long as the room is not made too cold thereby. More than half the deaths arising from contagious diseases in this country are produced by the habit of excluding the access of fresh air.

7. When persons are attacked by severe diarrhœa or dysentery, it is often better that they should be sent to a hospital than be badly treated at home. Infected clothes, bedding, apartments should be purified under the direction of the medical attendant or sanitary inspector. All that passes from the sick should be looked upon as highly poisonous, and be got rid of at once; and every vessel, and sink, and cloth, or article of bedding or clothing that it touches, ought to be disinfected. Sulphate of iron or carbolic acid should be put into the vessel used for receiving whatever passes away from the sick.

8. As drinking water is believed by many to be the great source of communicating diarrhœa and dysentery, the greatest pains should be taken to secure pure water for drinking purposes. None should be used

that is not quite bright; and this should be boiled and may be flavored with tea, coffee, or burnt bread. If at all turbid or discolored, it should be allowed to settle, and should be boiled and filtered before drinking. No water should be drunk which comes out of a dirty well, or that has been standing near a sink or a closet. All cisterns should be thoroughly cleansed, and wooden butts be charred or pitched inside. The water from the street pumps should be avoided. It is better that drinking water should be filtered through a magnetic spongy iron filter, and the filter should be frequently cleaned. Milk is better boiled or scalded.

No. 11.

146. The Prevention of Small-Pox. 1. Small-pox is most loathsome and fatal, and the most contagious of diseases.

2. Before the introduction of vaccination small-pox killed 40,000 persons yearly in England.

3. Thorough vaccination in infancy is an almost complete protection against small-pox.

4. Of unvaccinated people one out of every three attacked by small-pox dies.

5. Of perfectly vaccinated persons only one dies out of every two hundred attacked by small-pox.

6. Perfect vaccination is shown by the possession of four well-marked vaccine scars.

7. Vaccination is harmless and practically painless.

8. To ensure protection throughout life you should be revaccinated after the age of fifteen.

9. Every soldier and sailor is re-vaccinated; the result is that small-pox is almost unknown in the army and navy, even amid surrounding epidemics.

10. You can be vaccinated free of charge by the public vaccinator of your district.

11. Should small-pox break out at your house or among your neighbors, see at once to the vaccination of the household, and to the revaccination of all persons over 12 years of age, and at the same time inform the medical officer of health for your district.

12. Any patient suffering from small-pox should be removed to hospital; or, if kept at home, must have a separate room and nurse.

EVERY PERSON WHO HAS NOT BEEN SUCCESSFULLY RE-VACCINATED SHOULD BE VACCINATED AGAIN.

1. All needless woollen and other draperies should be removed from the room in which the patient lies, and be immediately disinfected if the rash has appeared.

2. All bed and body linen should be plunged into water, containing a disinfectant, *immediately* it is taken from the patient, and *before* it is removed from the room.

3. All glasses, cups, &c., used by the patient, should be carefully cleaned in boiling water, before being used by other persons.

4. Pocket handkerchiefs ought not to be used, but small pieces of rag, which should be burnt directly.

5. Nurses and others, whose hands come in contact with the patient, should wash them in water containing disinfectants, and afterwards in plain soap and water. The nurse or other person in charge of the sick should not mix with the rest of the family, and should wear a dress made of some washing material.

6. The sick room should be kept well ventilated. The lower sash may be raised two or three inches, and a piece of wood be placed underneath it, so as to close the whole of the opening, and thus allow of ventilation above the meeting bar of the lower sash.

7. The bed, mattress and woollen articles, which have been used by the patient, or exposed to the infection, should be disinfected as soon as the patient is convalescent. Their removal to the disinfecting chamber, when such exists is strongly advised.

To disinfect a room with the bedding and clothes, from a quarter to half a pound of sulphur should be burnt therein, the door, window and chimney being closely shut. The sulphur should be put in an earthen or tin plate, and placed over a vessel of water, in order to avoid the danger of fire. It may be ignited by placing on it a live coal, and the room must then be closed, and left for five or six hours.

8. After the patient has recovered, and before mixing with the family, he should take a bath, or be washed all over more than once with warm water and carbolic acid soap, and should not leave the sick room until he has been informed by his medical attendant that there is no longer any risk of infection.

No. 12.

147. Rules for the Management of Infants.

Clothing.—The infant should wear a broad flannel band round its body (not too tight), in addition to its usual clothes, which should cover the arms and neck as well as the body.

Weaning.—An infant should be weaned slowly, by degrees, beginning at the end of the seventh month. It should not have mother's milk after the ninth month. Baked flour or milk biscuits may be used to thicken its milk; or it may have "Liebig's Food for Infants." Later on it may have a little meat broth, or beef tea, with bread soaked in it. Fruit, potatoes, pork, fish, and such-like, are not to be given to an infant.

Sleeping.—The infant should sleep in a cot by its mother's bed in warm weather; but by the mother's side in winter, as warmth is essential to life and growth. It should not be rocked to sleep in a cradle. If the infant does not sleep, then it is ill, and requires medical advice. It should sleep at regular hours.

Washing.—The infant should be washed from head to foot in warm water twice a day, and well dried.

Feeding.—If the mother's milk is good, there is no better food for the infant until it is seven months old, when the mother must begin to wean it. If the infant is fed on cow's milk, a tablespoonful of lime water may be added to each bottleful and the milk sweetened by the addition of lump sugar, and a little warm water added at first, until the child is able to take the milk of full strength. Swiss milk is also good. The feeding-bottle is to be washed after each meal, and should be kept in cold water. The infant must have its meals at regular hours, whether it is fed from the breast or from the bottle. At first infants require food every two or three hours. The interval may gradually be increased as the child grows older and stronger.

Mothers are endangering the lives of their infants when they give them "teething powders," "soothing syrups," tea, brandy, or any other liquor."

Nursing.—A mother while suckling should live well. She should not drink spirits, nor much tea nor coffee, but may take as much milk or gruel as she likes. If while suckling she has palpitations of the heart, pain in the back, humming in the ears, or giddiness, she requires medical advice, or should commence weaning.

Airing.—The room in which the infant is kept should be aired by opening the windows for five minutes every hour. The infant should be taken out for a short time every day, unless it is raining, foggy, or a cold or east wind is blowing; and in fine warm weather the child cannot be out too much.

No. 13.

148. Accidents and Emergencies—What to do till the Doctor Comes.

Wounds and Cuts.—Wash the wound thoroughly with cold water, see that the bleeding ceases, put the edges of the wound together, and put on strips of plaster or cold water rags. *To stop bleeding*, in all cases *raise* the limb and apply pressure either directly over the wound by finger or rolled-up handkerchief or cap. If the bleeding be *bright scarlet* and *in spurts*, tie a bandage round the limb on the side nearest the heart. An elastic gas tube, pair of braces, or garters, form good bandages. Apply whilst the limb is raised up. Wounds of the head should be cleared of hair by cutting or shaving.

BLEEDING FROM THE NOSE.—Apply cold water to back of neck; a cold stone, a key, or piece of ice will serve. Raise the arms high above the head for a few moments.

BRUISES AND SPRAINS.—If a bruise can be treated *directly*, apply cold, ice, or vinegar and water, and keep part at perfect rest. Should time have elapsed, smear part injured with fresh butter or oil every ten minutes for two hours. (This is excellent for a black eye.) In later stages bruises need warmth and very gentle friction, with flannel bandaging. Sprains require perfect rest and support. A day's *absolute rest* at time of accident is worth a month's afterwards; therefore, never neglect a sprain.

BURNS AND SCALDS.—Carefully remove or cut off clothing. *Avoid breaking any blisters.* If injury be slight, and no wound exist, immerse part in cold water or a strong lukewarm solution of washing soda. If severe, cover at once with flour, or olive oil and lime water in equal quantities, and wrap carefully in cotton wool or wadding so as to keep out all air.

FRACTURES AND DISLOCATIONS.—Perfect quiet and rest must be enforced. If it be absolutely required to move the patient, some sort of splints are necessary to prevent further mischief. Portions of a broken box, rolls of newspapers, umbrellas, sticks, "stay bones," or the common trellis-work cover of a flower pot make excellent supports. If the leg be broken, after applying splints tie injured and sound leg together at ankle and knee, and if possible obtain piece of board to support both legs, to which they should be fastened.

FOREIGN BODIES IN THE EYE.—Don't rub. Keep eyelids closed as long as you can, not touching them. Bathe the eye well, and if lime or mortar be present, use weak vinegar and water, afterwards, with a camel's hair brush, put a drop of oil—castor oil by preference—between the lids.

Foreign Bodies in Ear.—Don't meddle unless the body be close at hand. You may do much mischief.

Bites of Animals.—Tie bandage round limb, suck wound well, and bathe in very hot water to encourage bleeding. Avoid caustics.

Stings of Insects.—Apply soda or ammonia and water. Snuff or tobacco applied moist will relieve the pain.

Choking.—Hold up and fix under left arm the person's head, open mouth by handle of spoon or thrusting his cheek between his teeth, and with the first two fingers of right hand endeavor to hook up the body. If you cannot, try and push it out of the way of the breathing passage.

Suffocation.—Remove at once all pressure from neck or chest. Apply smelling salts to nose, and dash cold water on face and chest. Attempt artificial respiration as in drowning. In *infants* for convulsions, put into warm bath about 100° for ten minutes. In *adults* you had better do nothing beyond seeing that the patient does not hurt himself, and can breathe freely.

Croup.—First, send for a doctor. Put child at once in hot bath, give full dose of ipecacuanha wine (a teaspoonful to a child two years old.) Apply poultice to throat and set water to boil so that the steam may come into the room.

Drowning.—Lay patient on back, cleanse mouth and nostrils, pull tongue forward ; grasp the arm just above the elbows, and draw them gently and steadily upwards until they meet above his head. Keep them in that position for two seconds. Then turn the arms down, and press them gently and firmly against the sides of the chest for two seconds. Continue these movements alternately, deliberately, and perseveringly *fifteen times a minute* for a considerable time. If spontaneous effort to breathe be made, still persevere, but, in addition, employ then means for restoring warmth such as rubbing, hot bottles, blankets and similar treatment.

POISONS.—*Clear the stomach* by emetics of mustard and water, yellow soap and warm water, or salt and water. You may give twenty grains of sulphate of zinc or ipecacuanha powder. Give plenty of warm water or flour and water. If there be pain in stomach and purging, give magnesia, chalk, raw eggs, or milk. If sleepy or excited, give strong coffee, and avoid sleep by continually arousing the patient.

No. 14.

149. Sanitary Maxims. 1. It is the duty of every householder to ascertain for himself whether his own house be free or not from well known dangers to health.

2. This duty, imperative at all times, is of surpassing urgency in a house where a woman is about to become a mother, or a surgical operation is about to be performed.

3. As a rule, the soundess of the sanitary arrangements of a house is taken for granted, and never questioned until "drain-begotten" illness has broken out. In other words, we employ Illness and Death as our drain-detectives.

4. Whenever gas from sewers, or the emanations from a leaking drain, a cesspool, or a fouled well, make their way into a house, the inmates are in imminent danger of an outbreak of typhoid fever, diphtheria, or other febrile ailments classed together under the term "zymotic," not to speak of minor illness, and depressed vitality, the connection of which with sewer gas is now fully established. Sewer gas enters a house most rapidly at night, when outer doors and windows are shut, and is then perhaps most potent in contaminating the meat, the milk, and the drinking water, and in poisoning the inmates.

5. The more perfect the public sewers of a town, the greater the danger to every house connected with such sewers, if the internal drain pipes of the house be unsound, and not *disconnected*. In houses so misconnected sewer air is "laid on" as certainly for the de-

triment of health as coal gas for illumination; and *you can turn off coal gas at the meter.*

6. Every hotel throughout the State, and every house let as lodgings, ought to have its sanitary arrangements *periodically* inspected.

7. A house in which children and servants are often ailing with sore throat, headache or diarrhœa is probably wrong in its drainage.

8. Scamped drain-work is one of the most dangerous of the sanitary flaws of new buildings; it is also one of the most common, and one of the most difficult to detect, and is rarely found out except by the illness it produces.

9. If you are about to buy or to rent a house, be it new, or be it old, take care *before you complete your bargain,* to ascertain the soundness of the sanitary arrangements with no less care and anxiety than you would exercise in testing the soundness of a horse before you purchase it.

10. If you are building a house or can achieve it in an old one, let *no drain be under* any part of your house, *disconnect* all waste pipes and overflow pipes from the drains, and place the soil pipe of the W. C. *outside* the house and ventilate it.

11. If there is a smell of drains in your house, or a damp place in a wall near which a waste pipe or a soil pipe runs, or a damp place in the cellar or kitchen floor near a drain or a tank, let no time be lost in laying bare the pipes or drains until the cause be detected.

12. If a rat appears through the floor of your kitchen or cellar and a strong current of air blows from the rat-hole when chimneys are acting and the windows and doors of the house are shut, feel sure that something is wrong with a drain.

13. If you are tenants, and your landlord refuses to remedy the evil, *do it at your own cost rather than allow your family to be ill.*

14. Many a man who would be aghast at the idea of putting small quantities of arsenic into every sack of

flour, and so by degrees killing himself and family, does not hesitate to allow sewer gas to poison the inmates of his house, even in the face of the strongest remonstrances of his medical adviser.

15. A landlord may reasonably look for interest on the money which he spends for the benefit of his tenant; but he is committing little short of manslaughter if, by refusing to rectify sanitary defects in his property, *he saves his own pocket at the expense of the health and lives of his tenants.*

16. If you be a landlord, don't intimidate your tenants, or threaten to give them notice to quit if they complain of defective drainage or sewer gas in the house.

No. 15.

150. How to Prevent an Epidemic.

To the People of the Flooded Districts of Maryland:

Keeping your houses and premises clean is at all times an imperative duty; but at this particular time, when you are in the midst of conditions likely to produce epidemic diseases, it is of surpassing urgency.

If a house is clean fever germs will pass it by.

If a house is dirty fever germs will enter and destroy its inmates.

Prevention is better than cure, and a stitch in time will save nine. A few cents wisely spent on sanitary precautions will often save many dollars, much physic, much suffering, and many valuable lives.

Every householder, whether rich or poor, should give personal attention to the cleanliness of his or her house, especially to the cellar and yard. Health is too important a thing to be entrusted to subordinates.

Allow no dark filth corners to exist inside or immediately in connection with your dwelling.

Burn all inflammable refuse or rubbish, and send away as garbarge such as you cannot burn.

Do not keep vegetables, fruit, or dirty linen in sitting-rooms or bed-rooms.

All slops should be constantly removed, and never allowed to remain in the house or yard.

Bury all putrifying material as soon as possible, and keep it well covered with lime until it is buried.

Keep your windows, floors, furniture, stairs and passages clean. Don't spare soap and water or whitewash. Let no rubbish or dirt-heap remain near your house, but clear it away at once, and be especially particular not to let any decayed vegetables remain in the house, as they give off a poisonous gas, which induces fever; in fact, *any bad smell*, either from drains or decaying matter, may bring fever.

Have no pig-styes, filthy stables, badly kept chicken coops, foul ditches, or stagnant puddles near at hand. Keep your privies and drains in perfect order, and never allow a smell to remain. See that they are properly cleaned and limed, or you can never breathe pure air; and if there is any difficulty about your privies, drains, water supply, or the clearing away of rubbish, that you cannot yourself overcome, apply at once to the town authorities for aid.

No decaying matter should be allowed in cellars; on the contrary, cellars should be kept sweet and clean, and as much exposed to fresh air as possible. They should also be made dry, by draining, if necessary.

The air of houses is supplied largely from the cellars, so that the common practice of storing all sorts of rubbish there should be condemned. If the air of the cellar is impure it rises into the rooms above and not unfrequently becomes a predisposing cause of diseases, such as diarrhœa, dysentery, cholera infantum, diphtheria, scarlet fever and numberless conditions of ill health.

A filthy privy, pig-pen or stable yard corrupts the air and the soil, and too often the wells of drinking water, by soakage.

Drinking the water thus polluted will give rise to serious diseases, such as diarrhœa, dysentery, typhoid fever and cholera. If you suspect your drinking water to be polluted, always boil it well before using, and afterwards filter it, if possible. Wells and cisterns should be frequently cleaned. *Water may be clear and sparkling, without odor or taste, and yet be dangerously polluted.*

Instead of the common privy vault, which is not safe even if cemented, it is best to use under the seat some receptacle which can be frequently removed and emptied. Galvanized iron tubs, whiskey or oil barrels sawn through the middle, a water-tight box, etc., answers the purpose very well.

Where filth has accumulated and it is necessary to use a disinfectant, dry earth or ashes, lime or copperas will serve a good purpose. Cellars, yards, stables, gutters, privies, cesspools, drains, etc., should be frequently and freely sprinkled with copperas solution, one-and-a-half pounds to a gallon of water. If required in large quantities, the copperas solution is easily prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

Whitewash is an excellent disinfectant, especially when a little carbolic acid is added to it, and should be used freely about houses, back yards, chicken coops, stables, etc.

There is no remedy for the pig-pen but to banish it without the limits of the town, and the sooner this is done the better for the health and comfort of the people.

Remember that cleanliness is next to godliness, and goes far towards preserving health. Many fearful diseases are caused and spread merely by dirt or filth, which contaminates water, air and food.

Your best citizens are now taking active and *proper measures* to protect the community against the horrors of an epidemic. See to it that you aid them by keeping your own premises clean. *This is especially incumbent on the poor.* Wealth may furnish the means of escape from an epidemic, but poverty trembles at its approach, and must succumb to the inexorable destiny.

Nothing is so economical as health and nothing so wasteful as disease.

C. W. Chancellor, M. D.
Secretary State Board of Health.

No. 16.

151. To the Citizens of Pikesville. There is no single source so productive of typhoid fever as that of polluted drinking water. Because water comes sparkling from the ground, clear, cool and refreshing, it is not safe to conclude that it must be pure and beyond question absolutely free from poison germs. The analysis of several specimens of well water from Pikesville shows that though they were clear and sparkling and sweet to the taste, not a single one was free from contamination. The wells are in too close proximity to privies, kitchen drains, barn-yards, pig-pens and other sources of filth, which not only pollute the water supply of the town, but contaminate the soil and surrounding air. *Absolute cleanliness of premises must be observed, and all accumulations of filth removed from day to day.*

The age and depth of the wells and the exceptionally wet season have also had much to do with the amount of impurities found in the water. Let every well, therefore, be thoroughly cleaned, and protected against all sources of pollution. Until this is done, it will not be safe to use any of this water for drinking or dietetic purposes, which has not been recently boiled or distilled.

Boiling the water is the only absolute safety under the circumstances.

C. W. Chancellor, M. D.,
Secretary State Board of Health.

No. 17.

152. Elements of Health.

Air.—Health depends on always breathing fresh air. Air once breathed is rendered unfit to be breathed again. Breathing and re-breathing the same air over and over again, as occurs in every unventilated room, is the first cause of many a break-down in health, and consequent sickness and misery. The object of ventilation is to constantly keep the air inside a room as fresh as the air outside. All windows should be made to open freely, so as to admit the fresh air and allow the used-up air to escape. Windows, to do this, require to let down from the top, as raising them from the bottom is never sufficient. This is most important in bed-rooms, where eight or more hours a day are spent—a period of time equivalent to four or five months in the year, and where, too often, with carefully-closed windows, a whole family spend this portion of their lives, getting gradually poisoned. It is a common error to suppose that night air is unwholesome. Night air is as good, and as necessary, as day air, and should be let freely into every bed-room. To avoid draughts, keep the door shut and window well open at the top. If cold winds and rain threaten to come in, raise the lower sash 6 inches, and place under its entire length a board made to fit; this will separate the sashes at the middle and allow free passage for air. Fire-places and chimneys should not be stuffed up, as is often done, to the exclusion of fresh air. A fire in the room keeps up thorough ventilation. It is well to remember that the nose is intended as the natural passage to breathe air through, and not the mouth. The nose is so constructed that the cold air is warmed before it enters the delicate lungs. Children should be taught to breathe only through the nose, keeping their mouths shut as much as possible when out in cold, damp weather. This habit would protect them through life from many lung diseases. On leaving a warm room and going out into the cold air, breathing through the mouth, or talking, should be avoided, unless a respirator is worn. These very useful guards are not sufficiently used and valued.

WATER.—This necessity of life abounds in our land, and should therefore, never be scarce or impure. Being essential for drinking and for the preparation of food, its purity is a matter of grave importance, particularly as the many cases of typhoid fever that occur can now be often traced to noxious matter getting into drinking water. Well water is frequently rendered impure by privy cesspools, ashpits, manure heaps, or leaking drains being too close to the well ; the liquid part sinks into the soil, and naturally finds its way to the lower level of the well. When this occurs, information should be given to the officers of the sanitary authority, who have power to remedy the evil. Nothing offensive should be thrown or deposited near a well. Where, from want of wells, the supply has to be taken from the doubtful waters of rivers, ponds, or ditches, the water, even though apparently clear, should always be filtered and boiled before being used. The boiling destroys any disease germs, so likely to be injurious to health, and the filtering removes any matter not in a state of solution. Filtering can be done by passing the water through a piece of clean flannel, or better, through a flower-pot filled with bits of magnetic carbide of iron. Water need never be scarce for domestic purposes if more care were taken of the rain water, to collect and preserve it. On the roof of an ordinary sized cottage about 4,000 gallons of good water falls annually, being an average of eleven gallons a day. To preserve rain water it is necessary that it should be kept from light and air. This can be done by underground tanks supplied by the rain-water pipes ; before the water enters the tank it should pass through a large filter. A pump is needed to raise it. Ordinary rain-water butts and cisterns should be well covered and cleaned out once a year.

Houses.—Houses and cottages are frequently so ill-constructed, that instead of being healthy abodes they are really traps for catching disease. Before renting a house the landlord or agent should be asked to produce a certificate signed by the medical officer of health of the district where the house is situated, certifying to its present sanitary condition. If this were the general custom, there would be fewer serious and fatal illnesses and many more healthy houses. Among the sanitary arrangements which should be attended to, the following are of vital importance: That the surroundings of the house are free from anything likely to give rise to bad smells. That there is a hall or porch, so that the door of the sitting-room does not open directly to the weather outside. The want of this protection is for half the year a certain cause of injurious draughts and absence of comfort. That the windows of every room open at the top. That there are drains for conveying away slop-water. These should be trapped outside. If there is a sink pipe inside, this should never be continuous with the drain, but open some inches above the outside trap. This interruption prevents sewer gases entering the house through the sink pipe. The water-closet should be up-stairs, and have a "wash-out" basin, with a good supply of water; the soil pipe should be outside, and at its highest bend be continued up and open on the roof, but not near an attic window. Between the soil-pipe and the sewer or dead well there should be a syphon trap, and between the house and the trap, close to the latter, an open grating, so that if any block occurs in the syphon it can be noticed at once and easily remedied. Bell traps should never be used; they are both defective and unreliable. The syphon trap is the best. Privies with cesspools, on the old-fashioned plan, are always a nuisance, and are only to be tolerated when well away from the house, the cesspool small, and used also as an ashpit. All dry refuse should daily be thrown in, and the contents kept dry. A valuable manure can be thus formed. Where houses are crowded together, particularly among the laboring classes, the privy cesspool should be done away with as a nuisance and injurious to health. If it is inexpedient to have water-closets, then a dry-earth system should be adopted, provision being made for the regular removal of the pails. This essential part of dry-earth systems can only be properly carried out by the local authorities.

Overcrowding.—This is a common cause of both injury to health and of the spread of infectious diseases. Families increase, while the capacity of the house stands still. It is now illegal to have a house, or any part of a house, so overcrowded as to be dangerous or injurious to the health of the inmates, whether or not members of the same family. A bed-room is considered to be overcrowded which does not afford to each adult person at least 300 cubic feet, and to each child at least 150 cubic feet of air.

Smells.—A bad smell is a signal of danger, and may bring sickness and disease with it. Therefore, it is most important that the air inside and about a house should be kept free from all offensive odors. When these do occur, they will be found nearly always to arise from untrapped or blocked-up drains, from privy cesspools, ashpits, manure heaps, or pig-styes. Whatever be the cause, there is no safety until it is remedied or removed. Pig-styes should only be kept where there is ample space, as they become offensive when too near the dwelling-house. Their floor should be paved and supplied with a trapped drain, and every day they should be cleaned out and the floor washed.

Cleanliness.—Cleanliness is not inaptly placed next to godliness; it embraces all those habits of tidiness and order in person and in house so necessary for domestic comfort and health. The following rules should be in general use : 1. The whole body should be washed or sponged daily with either cold or slightly warm water, and rubbed thoroughly dry afterwards. This keeps the pores of the skin clean, while refreshing and strengthening the body. It is best done on getting up in the morning, and need occupy only a few minutes. 2. Under-linen or flannels should always be taken off before going to bed, turned inside out, and hung up to air during the night. 3. Beds should not be made up in a hurry; all the sheets and blankets, upper and lower, should be shaken out and left as long as possible between the open door and windows of the bed-room, so as to allow them to be well aired before they are replaced on the bed. 4. Slops and soiled clothing should be removed as early as possible from bed-rooms. 5. It is a good habit to wash the hands before meals, particularly if soiled by work, and both hands and face before going to bed; also brush the teeth and comb the hair at night, as well as in the morning. There is no harm in occasionally oiling the hair when done lightly, but nothing is more objectionable than the habit some mothers have of plastering their children's heads with oil or pomatum (not always of the sweetest.) This is usually part of the toilet on Sundays or festive occasions, and renders the neighborhood of children most offensive to every sensitive nose.

Food.—Two good hearty meals in the day are sufficient for health, one before going to work and the other after work is over; that is, breakfast and supper, or what is the same, late dinner. Some lunch is needed between these meals, but should be light. A heavy meal in the middle of the day may suit children, but if hard work has to be resumed, it interferes with the work, and the work with digestion. Hot, heavy suppers taken shortly before going to bed prevent refreshing sleep, and are among the most frequent causes of attacks of indigestion. At the same time an empty stomach is to be avoided; a few biscuits or something equally light, is all that is required. Variety of diet is of importance to health; the stomach gets weary of a repetition of the same food every day. Hurry at meals is to be avoided—eat slowly and chew well. Bodily toil and manual labor can be best supported by a vegetable diet, as bread, porridge, &c., with the addition of milk, eggs, butter and cheese; meat is much inferior to these as a supplier of strength. But it is very different with mental labor; here a mixed diet, with animal food in moderation, is best. Fermented drinks will always have a place among articles of diet, although health can be maintained best without them. The most wholesome are those which contain the least amount of alcohol, such as good sound beer or claret; these when taken moderately with meals aid a weak digestion. The practice of drinking stimulants as aids to work is a serious mistake; it checks the desire for wholesome food, leads to excess, and sooner or later injures the health. Tobacco should not be smoked just immediately before or after meals, as it weakens digestion. Too much smoking is a harmful habit, causing nervousness, shaky hands, palpitation of the heart, want of appetite and sleeplessness; when any of these occur, tobacco should be left off, or used very seldom. The common practice of boys and growing lads smoking is a serious evil, as it checks their nutrition and growth; they think it manly, but it really prevents them becoming healthy men. Excessive tea drinking is an evil not unusual among working women, producing ill-nourished mothers and weakly babes. Tea should not be taken more than once or twice a day, and should never take the place of a substantial meal. Health depends greatly on good cooking; the object of cooking is to render food digestible and attractive, and to give at the same time the greatest amount of nourishment with the least amount of waste. Every opportunity of learning and improving in this art should be eagerly seized.

CLOTHING.—In our variable climate health cannot be maintained without the protection of seasonable clothing. It is always wise to wear flannel or merino next to the skin, of light texture in summer, and heavier in winter. Persons with delicate chests and liable to take cold easily, or who are subject to rheumatism, should wear flannels suitable to the season all the year round. Children especially require to be warmly clad. The cruel custom of allowing their arms, legs, and chests to remain bare, with the idea of hardening them, cannot be too strongly condemned. It is thus that the seeds of disease get sown among children who, if properly clothed, would otherwise be strong and healthy. It is very important to keep boots and shoes strong and in good repair for wet wether. Serious illnesses are constantly occurring from persons having to stand or sit any time with wet, cold feet. This is often the case with children belonging to the laboring classes, who with thin or broken shoes wade through wet roads to school, and sit for hours in their damp shoes and stockings. It is respectable to wear shoes and stockings, but when they do not exclude the wet it would be safer for children to go barefooted, or else to wear wooden clogs, which keep the feet warm and dry, and ought to be much more used than they are.

INFANTS AND MOTHERS.—The best food for infants is the mother's milk, and, provided the mother and child keep in good health, none other is required for the first six months.

The child should be put to the breast a few hours after birth, as it encourages the early flow of milk. It should not be dosed with castor oil.

The nursing mother, having to support both herself and a growing child, should be careful to keep up her appetite by getting out daily, as soon as she is able, for exercise in the open air. She should eat frequently of nutritious food, and drink plenty of milk. Wine, beer and stout are unnecessary ; if they increase the quantity of milk, they do so by making it watery and weak.

When the mother cannot give milk to her child, the best substitute is cow's or goat's milk, and if any difficulty in getting these exists, the Swiss condensed milk, well diluted, answers admirably. To cow's milk should be added half its bulk of tepid water, and it should be sweetened with sugar, or what is better, "sugar of milk." The addition of a little cream is an improvement. Two feeding bottles are needed, one for day, and one for night; they should be kept very clean. After six months, and when some teeth are cut, the child is better for a more varied diet, to which may now be added biscuit powder, and weak beef tea thickened with bread. These are not to take the place of milk, which should form the staple food of childhood's early years.

Until infants are twelve months old it is worse than useless giving them starchy food, such as arrowroot and corn-flour, as they cannot digest it.

At nine months, the infant should be weaned, not suddenly, but by gradually substituting cow's milk, and the foods already mentioned.

Oatmeal porridge is a cheap, wholesome food for children at all ages above one year. The best mode of preparing it is to boil the oatmeal well in water, keeping it stirred, add salt, and eat with cold milk. Some use sugar instead of salt, but children soon get a distaste for sweet porridge, which they never do for salt.

NURSING THE SICK.—Good nursing is not only an invaluable aid to medical treatment, but an essential part of it. The nurse should be cheerful, quiet and watchful, not talkative or fidgety; nothing worries a sick person more than a restless nurse. She should also be clean in habits and tidy in person; her nursing dress should be a light calico print; black or rustling dresses should never be worn in the sick room. The room should be kept well aired, either by a fire or by occasionally opening the windows, taking care to avoid draughts. A close, stuffy room is sure to retard the patient's recovery. Anything offensive to the eye or nose should be at once removed. The bed-clothes should be sufficient without being too heavy, as any weight of bed-clothes heats and weakens the patient. Frequent changes of bed linen and night dresses are refreshing as well as necessary. The sick person's hands and face should be washed daily, and the hair combed. Also every few days or oftener the whole body should be gently sponged with warm water containing a twentieth part of vinegar. When doing this, only a small portion of the body should be sponged and well dried at a time. This often removes restlessness and induces refreshing sleep. When there is much thirst, as in fever, let the patient drink freely of water, toast and water, or of lemon sliced in water. But the best drink is milk, as it is likewise a supporting food; should it lie heavy, boil it or add some soda water to it. On no account should stimulants be given, unless ordered by the doctor. When the sick person cannot digest much at a time, regular meals should be avoided and liquid food given every hour, such as milk, thin arrowroot, or beef tea. In making beef tea, the chief nutriment in it is generally rendered indigestible by overheating it. It should be made thus: Mince two ounces of good lean beef and add four ounces of cold water, let it stand for half an hour, then place the vessel in a saucepan of hot water and keep it near the fire, stirring and watching until the beef is warm enough to drink, then strain and serve with salt and pepper. This beef tea is red, if overheated it becomes clear and not so nutritious; it does not keep, so should be made fresh as required. Liebig's extract is much less nutritious, as it contains no albumen; it may be given occasionally with advantage instead of alcoholic stimulants. All food for the sick person should be served cleanly and tastefully, and in small quantities at a time—the sight of a large quantity only disgusts the patient, and prevents enough, if any, from being taken.

No. 18.

153. Rules for Bathing. *Cold Baths* consist of water at a temperature of from 50° to 70° of Fahrenheit's thermometer. The cold bath is the best form in which the bath can be used for the general purposes of health. The action of the cold water upon the skin should not be continued for more than two, or at the most, three minutes. At the end of this time the skin should be quickly wiped dry, and it should be then briskly rubbed with a coarse cloth until it is quite warm and glowing. When the warm glow does not rapidly occur, the water should not be used either so cold or so long. The cold bath is best taken at first rising in the morning, and

may be most advantageously used every day. It is bracing, strengthening, and increases the appetite. It cannot, nevertheless, be safely used by weak and delicate people. It is important that no bath should be taken for a couple of hours after a full meal, or after long fasting, or excessive fatigue.

The Tepid Bath consists of water at a temperature of from 85° to 95°. It neither cools nor warms the body to any material extent. It is cleansing and refreshing, but hardly invigorating like the cold bath. It is better than the cold bath for persons of weak vital force and languid powers of circulation, especially in cold weather. There is no good reason for continuing the immersion in it longer than in the cold bath. The same or even more care should be taken to dress quickly after taking a tepid bath ; as it does not tend so much to produce a warm glow upon the skin.

The Warm Bath consists of water at a temperature of from 96° to 104°. It promotes the flow of blood *at once* through the vessels of the skin without producing the preliminary shock and chill, and quickens the beat of the pulse. It is soothing, and very cleansing. It relieves colds in the head and chest, rheumatism, and most disorders that are attended by a dry, chilly state of the skin, and obstructed or retarded flow of blood. It may be used every day, if for not more than five minutes at a time ; or once or twice a week, if for ten minutes at a time : and may be most advantageously taken in the evening. The habit of taking a warm bath once in the week is very strongly to be recommended ; but very great care must be taken to dress quickly in warm clothes after using it, so as to have extra protection against cold winds and chilling draughts.

The Hot Bath consists of water at a temperature of from 104° to 110°. With vigorous persons who can advantageously use it, a copious perspiration is quickly produced ; it is chiefly employed on this account. Ten minutes is generally long enough to remain in a hot bath. People should not remain as long in it, or, indeed, use it again, when it produces a feeling of faintness, flushing of the face, throbbing of the temples, and headache. It is employed by medical men for the cure of some kinds of disease, rather than for the more general purposes of bathing. As a general rule, it should not be used at all without the advice and direction of some skilled medical attendant.

The Turkish Bath is really a hot-air bath, and produces very copious perspiration. It is only safe for fairly vigorous and healthy people, and should not be used more than once, or at most twice, in the week, and the full perspiration should not be allowed to continue more than from fifteen to twenty minutes. Persons in delicate states of health must on no account have recourse to it habitually, or for remedial purposes, without medical advice and guidance.

The Swimming Bath has the great advantage that muscular exercise is taken whilst the body is immersed in the water. If the water is cold, the immersion should not be continued for more than 4 or 5 minutes at the most. When the water is tepid, the immersion may be for a little longer time. As a general rule, the swimmer should leave the bath as soon as reaction upon the skin, and surface glow, have been fully established. This precaution should above all things be observed in open air, and especially in sea-bathing. The chief advantage of sea-bathing is, that there is constant motion of the body all the time, and change of exposure of the skin, to the influence of air and of water, at frequent intervals.

The Shower Bath should never be used by persons in delicate health, and with feeble blood-circulation, on account of the nervous shock which the sudden deluge of cold water occasions. It is fortunately free from the objection of too long continued exposure, as the quantity of water that can fall from the bath is limited to a guarded and reasonable amount. But in cold weather the water should always be tepid, rather than cold, and the dressing, after its use, should be managed very quickly.

No. 19.

154. How to Keep Milk Sweet and Fresh. It is not necessary to invest in a sterilizing apparatus, as any housekeeper can arrange one equally efficient for herself. All that is necessary is to have some bottles, capable of containing the milk to be used in a day; each large enough to contain what will be needed at one time. These bottles and their corks should be thoroughly cleansed by boiling in a solution of washing-soda. The corks should be selected, and of the best variety.

When the milk is brought to the house, it should be placed in these bottles, which should be arranged on a wire frame in a pot of water, and boiled for fifteen minutes. They should then be corked securely and placed in the refrigerator with the ice *upon* them, not under them. In the country they may be lowered into the water of the spring-house. Milk thus treated will not only keep sweet and fresh, but almost any impurity it may originally contain will be rendered innocuous.

The flavor of boiled milk is unpleasant to many persons; but this may be remedied by the addition of a little coffee or cocoa. At any rate, one must not expect too much in this world; and for the sake of safety put up with the unpleasant taste, or learn to like it.

No. 20.

155. The Sanitary Alphabet.

As soon as you are up, shake blankets and sheet;
Better be without shoes, than sit with wet feet;
Children, if healthy, are active, not still;
Damp beds and damp clothes will both make you ill;
Eat slowly, and always chew your food well;
Freshen the air in the house where you dwell;
Garments must never be made to be tight;
Homes will be healthy if airy and light;

If you wish to be well, as you do, I've no doubt,
Just open the windows before you go out;
Keep your rooms always tidy and clean,
Let dust on the furniture never be seen;
Much illness is caused by the want of pure air,
Now to open your windows be ever your care.
Old rags and old rubbish should never be kept;
People should see that their floors are well swept;
Quick movements in children are healthy and right;
Remember the young cannot thrive without light.
See that the cistern is clean to the brim;
Take care that your dress is all tidy and trim;
Use your nose to find out if there be a bad drain,
Very sad are the fevers that come in its train.
Walk as much as you can without feeling fatigue;
Xerxes could walk for full many a league.
Your health is your wealth, which your wisdom must
keep,
Zeal will help a good cause, and the good you will reap.

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PART VII.

REPORT ON THE REGISTRATION OF BIRTHS AND DEATHS.

156. Necessity for Registration The subject of an efficient registration of the births and deaths occurring in the State has been urged in nearly all the reports of the State Board of Health. Few men appreciate the virtue of such statistical information. Many regard the time and money expended in the preparation of registration tables as a foolish waste of effort; but the enlightened statist or physician may be pardoned, if in looking at one peculiar evidence of advancement, he should select as a touchstone of civilization a good and efficient system for the registration of vital statistics. Such records are of the highest value in determining questions of health, the duration of life, the movement of population, etc. In most, if not all European countries, these statistics are carefully collected and published periodically, either annually, biennially or quarterly. In this country the decennial census is the only means employed by the Federal Government to secure any record of births, marriages and deaths, and this is necessarily both inaccurate and imperfect. Unless, therefore, the individual States undertake the collection of their own vital statistics, no accuracy can be hoped for.

The collected records of deaths and of sickness among the people is one of the most powerful aids to the hygienist. By figures the health of a town or country is shown at a glance; by figures the efficiency of preventive measures, such as vaccination, is tested and the fatality of epidemics traced; by figures we ascertain the proportion of deaths to the whole population; and it is obvious that without the use of a system of vital statistics our knowledge of the number of deaths, births and marriages in a community must be vague, uncertain, and often erroneous.

The most important statistics required for health purposes are:

I. The annual mortality.
II. The annual rate of increase of population.
III. The causes of death.
IV. The amount of sickness to population.
V. The births to population.
VI. The relative number of live and still-born children.
VII. The mean ages at death.
VIII. The number of marriages to population.

Hygienists must not be satisfied with merely the annual rate of mortality, but the deaths should be grouped and classified with (1) male and female; (2) under and over five years; (3) grouped according to the age at death, &c.

Although a large number of facts are required for any certainty of deduction, we are not precluded from reasoning upon a small number. There are many facts which, from their nature, cannot be collected, but there is always a balance of probability in favor of the average even of a smaller number of facts approaching closely to the true average.

Excellent examples of classification, grouping, &c., are to be found in the accompanying tables, prepared by Mr. A. R. Carter, Secretary of the Health Department of Baltimore, and furnished through the attention of Dr. James A. Steuart, Health Commissioner of the city.

157. **Record of Deaths and Births in Baltimore.** The whole number of deaths in the city of Baltimore, during the year 1888, were 8,936, being 3,281, more than in 1878, or an increase of about 6 per cent. in ten years, which is *pari passu* with the increase of population.

Of these 6,894 were among the white population (5,355 natives, 1,539 foreigners), and 2,042 were colored persons. Among the whites the male deaths exceeded the female by 282, while among the negroes there were 79 more deaths of females than males. This disparity may be accounted for in several ways: 1. Negro women are generally more exposed than white women to weather and to physical hardships. 2. Negro women are usually subjected in their homes to very unsanitary surroundings, while the men spend the greater part of their time abroad in the open air.

Of the whole number of deaths, 4,566 were males (3,578 whites and 988 negroes); 4,370 were females, in the ratio of 3,316 whites to 1,054 negroes, which shows an aggregate of 196 deaths more among the male than the female population.

There were 3,952 deaths among children under five years of age, being nearly 43 per cent. of the entire deaths. The greatest mortality occurring among persons between the ages of ten years and seventy years was between the ages of 25 and 35 years (712); the least mortality was: 1. Between the ages of 10 and 15 years (130.) 2. Between the ages of 15 and 20 (226) The greatly increased mortality between the age of 25 and 35 years was caused by consumption, which is more prevalent at this period of life than any other.

The season of the year most fatal to human life in the city of Baltimore in 1888 was during the months of March, July and August. The season in which fewest deaths occurred was in the months of April, May and November. The increased mortality in the months of July and August was occasioned by deaths from cholera infantum, (429 for the quarter ending 29th September.)

Some striking facts are presented in regard to the mortality among children. Of the 9,079 children reported born in the year, there were 324 reported born dead, or about one still birth in 22. The number of children who died before the completion of their first year was 2,603, or nearly 30 out of every hundred, which is more than one out of every four children Including the children born dead and those who died before the completion of the first year, the number of deaths amounted to 2,957, or more than one out of every three children born.

The number of children born dead, and the number dying in their first year is simply appalling, and might assuredly be diminished by the influence of competent circumstances and moral habits. There can be no doubt that the great mortality among children under five years old, namely, 3,952, is occasioned in a great measure by the noxious exhalations from 70,000 or 80,000 privy vaults and cesspools, which constantly poison the atmosphere of the city during the summer months, when the mortality sometimes ranges from 300 to 400 per month.

While the number of children who do not survive the first year of their life will always remain very considerable, there can be no doubt that the aggregate mortality would be greatly lessened by proper attention to sewerage, drainage, ventilation and food. The deleterious operation of impure air, deficient or improper food, and cold and moisture on the delicate organs of infant life is so well known that it is the clear duty of every man of science and every philanthropist, whether he has to deal with vital or common physics, to impress upon the city and State authorities the great importance of instituting and enforcing the highest degree of sanitation practicable, in order that the "slaughter of the innocents" may at least be reduced to a minimum. Large sums of money are expended annually by the public to fit children for citizenship. Would it not also be wise to spend money to investigate those causes which tend to shorten their lives, and which, however unseen they may be, are none the less potent for evil?

The following tables from the report of the City Health Department present a statistical record of the births, deaths and marriages reported, and of the total mortality, for the year ending December 31st, 1888.

Respectfully submitted,

C. W. Chancellor, M. D.
Superintendent Vital Statistics.

No. 158.

TABULATED STATISTICS

OF THE

CITY OF BALTIMORE.

TABLE NO. 1.

159. Deaths from all Causes.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Abcess	....	....	....	....	....	1	....	....	....	....	....	....	1
" Cerebral	....	2	1	....	....	1	1	....	....	....	....	....	5
" Hepatic	....	1	....	1	....	....	....	....	2	1	1	1	7
" Umbilical	....	....	1	....	....	....	....	....	....	....	....	....	1
" Femoral	....	...	1	....	....	....	....	....	....	....	....	....	1
" Perineal	....	....	1	....	....	....	....	1	....	....	....	....	2
" Pelvic	....	....	1	1	....	....	....	....	1	....	....	....	3
" Psoas	....	....	....	....	....	....	1	1	....	....	....	....	2
" Renal	....	....	....	....	....	....	1	....	....	....	1	....	2
" of Ear	....	....	1	....	....	....	....	....	...	....	....	1	2
" of Knee	....	....	1	....	....	....	....	....	....	....	....	....	1
" of Side	....	....	....	1	....	....	....	....	....	....	....	....	1
" of Leg	....	....	....	....	....	....	....	1	....	....	....	....	1
" Vagina	....	....	....	....	....	....	....	....	....	....	....	1	1
Anæmia (Pernicious)	....	....	....	....	....	1	....	....	....	....	1	1	3
Amyloid Liver	1	....	....	....	....	....	...	....	....	....	....	....	1
Anæmia	1	1	....	1	1	....	1	....	....	3	....	....	8
Aneurism of Aorta	1	2	....	....	1	2	2	....	....	1	....	....	9
of Femoral Artery	1	....	....	....	....	....	....	....	....	1	....	....	2
Thoracic	....	....	....	....	....	....	....	1	....	....	....	....	1
Aortic Stenoses	....	....	....	....	....	1	....	1	....	...	....	...	2
Apoplexy	12	18	17	15	16	18	11	11	14	10	6	16	164
Arthritis	1	....	....	1	....	....	....	....	....	....	....	....	2

Ascites	1	1	2	....	....	1	1	....	....	1	1	2	10
Asthma	11	4	7	1	3	1	4	3	1	3	4	4	46
Asthenia	4	3	5	1	2	4	8	7	10	5	5	4	58
Atelectasis Pulmonum	1	1	1	....	...	1	....	....	....	2	....	1	7
Abortion	....	....	....	1	....	....	....	....	1	....	....	1	3
Abortion, Criminal	....	1	....	....	....	....	....	....	....	1	....	....	2
Albuminuria	....	1	1	1	1	....	....	....	....	....	1	1	6
Angina Pectoris	....	1	3	2	1	1	....	1	2	1	2	1	15
Asphyxia	....	1	1	....	....	1	3	....	1	1	2	2	12
Adynæmia	....	....	1	1	....	....	1	....	....	....	...	....	3
Amenorrhœa	....	....	1	....	....	....	....	....	....	....	....	....	1
Atrophy	....	....	2	....	....	1	....	....	....	....	....	....	3
" Acute Yellow of Liver	....	....	....	....	1	....	....	....	....	....	....	....	1
Addison's Disease	....	....	....	....	....	1	....	1	....	....	....	....	2
Adenitis	....	....	....	....	....	....	....	....	1	....	....	....	1
Acute Indigestion	....	....	....	....	....	....	....	....	1	....	....	....	1
Bright's Disease	20	13	14	18	15	19	16	9	14	10	11	14	173
Burns	4	4	2	2	....	1	5	1	3	5	4	5	36
Capillary Bronchitis	8	8	10	12	7	2	....	3	3	8	5	14	80
Congestive Chill	1	....	1	....	....	....	1	2	....	1	...	1	7
Catarrh	1	....	....	....	....	...	....	....	....	....	....	....	1
" Senile	....	1	....	....	....	...	....	....	....	....	....	....	1
" Bronchial	....	3	4	5	2	3	1	2	2	1	....	3	26
" Gastro Intestinal	....	....	....	....	....	....	1	....	....	....	....	....	1
Congestion of Bowels	....	....	....	....	....	....	....	....	....	....	....	2	2
Cirrhosis of Liver	5	8	4	3	3	5	....	8	4	7	7	4	58
Concussion of Brain	2	....	1	....	6	2	3	1	1	2	1	2	21
Compression of Brain	1	....	....	....	....	....	....	....	....	....	....	.. .	1
Colitis	....	....	....	....	....	2	1	....	....	....	....	....	3
Cancer	....	....	....	....	....	....	....	2	1	....	....	....	3
" of Stomach	2	6	4	2	6	6	5	7	3	7	5	1	54
" of Neck	1	....	....	....	2	1	...	....	....	....	1	....	5
" of Bowels	2	....	1	2	....	1	....	1	....	....	1	....	8
" of Pylorus	1	....	....	....	....	1	....	....	....	....	....	1	3

TABLE No. 1—continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Cancer of Pelvis	1	....	....	....	....	....	....	2	....	....	....	....	3
" of Uterus	2	3	9	2	1	3	2	8	5	2	8	3	48
" of Breast	3	3	4	....	4	2	2	4	3	....	2	4	31
" of Liver	....	2	4	3	....	5	3	1	4	4	2	1	29
" of Throat	....	1	....	....	....	1	....	....	....	....	....	....	2
" of Face	....	1	....	....	....	....	1	....	....	....	1	1	4
" of Abdomen	....	1	....	....	1	....	....	....	....	1	....	....	3
" of Transverse Colon	....	....	1	....	....	....	....	....	....	....	....	....	1
" of Ovaries	....	....	1	1	....	....	....	....	....	....	....	1	3
" of Tibia	....	....	1	....	....	....	....	....	....	....	....	....	1
" of Vagina	....	....	1	....	....	....	....	....	....	....	....	....	1
" of Oesophagus	....	....	....	1	....	....	....	....	....	....	....	....	1
" of Rectum	....	....	....	....	4	1	....	....	....	....	....	....	5
" of Ventricular	....	....	....	....	1	....	....	....	....	....	....	....	1
" of Vulva	....	....	....	....	1	1	....	....	....	1	....	....	3
" of Omentum	....	....	....	....	1	....	2	1	....	....	....	....	4
" of Pancreas	....	....	....	....	....	....	1	....	....	....	....	....	1
" of Tongue	....	....	....	....	....	....	....	2	....	....	....	2	4
" of Arm	....	....	....	....	....	....	....	....	1	....	....	....	1
" of Mesentery	....	....	....	....	....	....	....	....	2	....	....	....	2
" of Kidney	....	....	....	....	....	....	....	....	....	1	....	....	1
" of Diffused	....	....	....	....	....	....	....	....	....	1	....	....	1
" of Leg	....	....	....	....	....	....	....	....	....	....	1	....	1
" of Groin	....	....	....	....	....	....	....	....	....	....	....	1	1
" of Lip	....	....	....	....	....	....	....	....	....	....	....	1	1

Congestion of Brain	5	7	6	5	....	4	4	12	7	2	2	5	59
" of Lungs	12	11	10	3	2	4	2	2	3	4	3	13	69
" of Liver	....	....	....	....	....	....	....	....	1	....	....	....	1
Cancrum Oris	....	....	....	2	....	....	....	....	1	....	....	....	3
Consumption of Bowels	2	....	1	....	....	1	1	....	1	....	1	....	7
" of Lungs	66	112	149	97	89	110	71	88	94	79	83	113	1151
Convulsions	26	25	45	18	15	26	25	20	31	22	17	34	304
" Puerperal	....	1	....	....	....	....	...	1	....	....	....	1	3
Croup	17	16	17	11	6	3	3	5	1	9	8	2	98
Colic	1	....	....	.. .	....	....	....	....	1	....	....	....	2
Calculus	....	1	1	1	....	1	....	....	....	....	....	....	4
Child-birth	....	1	1	2	2	1	1	3	2	....	2	....	15
Cholera Morbus	....	1	....	....	1	5	12	8	1	1	....	1	30
" Infantum	....	....	....	....	4	144	269	167	56	3	3	3	654
Cephalhæmatoma	....	1	....	....	....	....	....	....	....	....	....	....	1
Cyanosis	....	5	1	....	5	4	4	3	4	1	....	4	31
Cellulitis of Leg and Foot	....	1	....	....	1	....	....	....	....	....	....	....	2
Cystorrhœa	...	....	1	....	....	....	....	....	....	....	....	....	1
Caries of Spine	....	....	1	....	....	....	....	1	...	....	1	....	3
Carbuncle	....	....	....	....	....	....	....	....	1	....	....	1	2
Disease of Heart	28	34	42	29	29	41	33	29	37	22	29	51	404
" of Spine	1	....	....	1	....	1	....	....	....	....	....	....	3
" of Uterus	1	....	....	....	....	....	....	....	....	....	....	....	1
" of Prostate	....	....	2	....	....	....	....	....	....	....	....	....	2
" of Liver	...	....	1	....	....	....	1	....	....	....	....	....	2
" of Hip Joint	....	....	....	....	....	1	....	....	1	....	....	....	2
" of Knee Joint	....	....	....	....	....	....	....	....	....	1	....	....	1
Debility	3	1	1	....	....	....	....	....	....	....	1	....	6
Dropsy, General	2	1	2	2	4	3	1	....	1	4	3	2	25
" Cardiar	....	1	...	....	....	....	....	....	....	1	1	....	3
Dyspepsia	1	....	....	2	1	....	....	1	....	....	....	.. .	5
Drowned	1	....	3	6	....	9	2	10	7	5	2	....	45
Dysentery	1	2	1	2	3	14	55	47	22	10	6	4	167
Dentition	5	5	6	4	8	14	16	16	13	8	7	8	105

TABLE No. 1—continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Diabetes	2	....	3	4	3	1	....	2	2	....	....	2	19
Diarrhœa	5	5	8	4	1	13	35	30	23	5	5	2	136
Diphtheria	11	3	6	6	1	5	3	6	16	16	24	21	118
Delirium Tremens	....	...	....	....	1	....	....	....	1	1	....	....	3
Dermoid Cyst	....	....	....	....	....	....	1	....	....	....	....	....	1
Entero Colitis	1	2	1	1	3	2	21	15	12	5	2	1	66
Endocarditis	1	....	3	4	1	3	....	2	1	....	1	1	17
Erysipelas	1	5	4	2	1	3	1	3	4	2	....	4	30
Embolism	....	3	....	....	1	....	1	....	....	1	....	1	7
Excessive Vomiting	....	1	....	....	....	....	....	....	....	....	....	....	1
Epistaxis	....	....	1	....	....	....	....	....	....	....	....	....	1
Elephantiasis	....	....	1	....	....	....	....	...	....	....	....	....	1
Exposure	....	....	2	....	....	...	...	....	....	....	....	1	3
Effusion of Brain	....	....	1	....	1	....	....	....	....	....	....	....	2
Epilepsy	....	....	....	2	4	1	1	2	3	....	....	2	15
Empyema	....	....	....	....	1	....	....	....	....	....	....	....	1
Explosion of Gas	....	....	....	....	....	....	....	1	....	....	....	....	1
Electric Shock	....	....	....	....	....	....	....	....	....	1	....	....	1
Fever, Malarial	4	1	3	2	1	7	4	6	7	5	1	4	45
" Typho-Malarial	2	2	2	1	2	3	2	6	6	6	2	7	41
" Intermittent	....	....	1	....	....	1	....	2	1	2	....	....	7
" Puerperal	....	2	4	2	1	....	....	2	1	3	1	...	16
" Remittent	1	....	2	2	....	....	1	1	3	2	2	3	17
" Scarlet	8	3	3	3	2	2	5	....	2	6	3	7	44

Fever, Typhoid	7	8	6	6	5	10	4	26	34	21	17	17	161
" Cerebro-Spinal	1	5	....	2	2	3	4	....	2	1	....	2	22
" Catarrhal	....	....	....	....	....	....	...	....	....	....	...	1	1
Fracture of Femur	....	3	1	....	1	....	1	....	....	2	....	....	8
" of Skull	....	1	1	2	1	2	1	3	....	....	1	2	14
" Vertebræ	....	....	....	....	....	....	1	3	....	....	....	....	4
" Leg	....	....	....	....	....	....	....	1	....	....	....	....	1
" Ribs	....	....	....	....	....	....	....	....	....	....	1	....	1
" Neck	....	....	....	....	....	....	....	....	....	....	....	1	1
Fistula	....	....	....	....	1	....	....	....	....	1	....	....	2
Gangrenous Cellulitis	....	....	....	....	....	....	....	....	....	....	1	....	1
Gastro Enteritis	6	4	3	1	2	10	21	15	24	14	4	7	111
Gangrene	....	....	1	....	....	....	....	....	....	....	1	....	2
" of Leg	....	1	....	....	....	....	....	1	....	....	....	....	2
" of Mouth	....	....	....	....	1	....	....	....	....	....	....	....	1
" of Senile	....	....	2	3	...	1	....	....	1	....	2	....	9
Glioma of Nose	....	....	1	....	....	....	....	....	....	....	....	1	2
Gall Stone Colic	....	....	....	....	....	1	....	....	....	....	...	....	1
Hydrocephalus	1	....	4	1	....	2	2	3	....	1	....	3	17
Hypertrophy of Liver	....	....	1	....	2	....	....	...	....	....	....	....	3
Hydrothorax	....	....	1	....	1	....	....	....	....	....	2	1	5
Hæmatemesis	....	....	....	2	1	....	....	....	....	....	....	....	3
Hemorrhage of Navel	1	....	....	1	....	....	2	....	....	....	....	1	5
" of Brain	2	4	2	1	2	3	2	3	3	1	3	3	29
" of Lungs	1	2	2	1	2	2	3	....	1	4	4	....	22
" of Uterus	....	....	....	....	1	....	....	....	....	....	....	....	1
" of Bowels	....	....	....	....	....	1	....	....	....	1	....	....	2
" of Kidneys	....	....	....	....	....	....	1	....	...	....	....	....	1
" Post Partem	1	1	1	....	1	1	....	1	1	....	....	....	7
" Stomach	....	....	....	....	....	1	....	1	....	....	....	....	2
Hæmoptysis	....	....	....	1	....	....	....	1	....	....	1	....	3
Hernia	....	1	....	....	....	....	2	....	....	....	....	1	4
" Strangulated	1	2	....	1	....	1	1	....	....	....	....	....	6
" Inguinal	....	....	....	1	....	....	....	....	....	....	....	....	1

Table No. 1—continued.

Causes of Death.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Totals.
Hypostatic Congestion	....	....	....	....	....	....	....	....	1	....	....	....	1
Inanition	12	4	20	9	13	27	20	19	29	4	10	14	181
Ischuria	....	3	....	....	....	....	....	....	....	....	....	....	3
Indigestion	....	1	1	1	....	1	....	1	....	....	....	2	7
Insanity	....	1	1	....	....	....	1	....	3	2	1	....	9
Injuries of Spinal Cord	....	1	....	....	....	....	....	....	....	....	....	....	1
Intussusception	....	1	1	3	....	2	....	1	1	....	....	3	12
Intemperance	3	3	2	5	2	4	1	3	2	2	....	9	36
Insolation	....	....	....	....	....	6	1	....	....	....	....	....	7
Ileus	....	....	....	....	....	....	1	....	....	....	1	....	2
Inflammation of Brain	1	3	....	....	3	5	1	2	8	2	1	1	27
" of Bladder	....	....	3	4	1	1	2	1	....	1	....	1	14
" of Bowels	1	2	4	5	4	5	11	17	17	3	3	7	79
" of Stomach	4	8	8	14	3	6	4	2	4	8	10	6	78
" of Bronchi	11	13	20	15	10	6	8	4	7	10	8	14	126
" of Kidneys	6	4	11	3	1	6	6	5	7	9	4	11	73
" of Larynx	3	....	1	....	2	1	....	....	....	3	3	4	17
" of Liver	1	1	3	....	3	1	....	1	....	....	2	2	14
" of Peritoneum	2	4	6	4	4	4	4	5	4	1	3	8	49
" of Pleura	1	3	5	1	....	....	2	....	....	3	....	1	16
" of Pericardium	....	1	3	....	1	1	1	2	....	...	3	1	13
" of Tonsils	....	....	....	1	1	....	....	1	1	....	....	2	6
Jaundice	....	2	2	....	2	1	2	3	2	1	1	....	16
Leucocythæmia	1	....	....	....	....	1	....	....	....	....	...	....	2

Lithotomy	....	....	....	1	....	....	....	....	....	....	....	....	1
Lightning	....	....	....	....	....	....	....	1	....	....	....	....	1
Lymphadenoma	....	....	....	....	....	....	....	1	....	....	1	....	2
Laparotomy	....	....	....	....	....	....	....	....	....	1	....	....	1
Metritis	1	....	....	....	....	....	....	....	....	....	....	....	1
Malformation	2	2	....	1	....	....	....	1	1	1	....	....	8
Marasmus	14	13	25	12	8	20	40	34	51	32	7	20	276
Measles	21	35	49	30	20	12	4	2	1	....	....	2	176
Meningitis	7	14	20	16	10	27	15	11	7	9	15	14	165
" Tubercular	7	7	7	7	6	4	5	3	8	7	4	5	70
" Spinal	....	....	....	....	....	....	....	1	....	....	....	....	1
Mal-nutrition	3	1	....	....	1	6	8	5	7	....	1	3	35
Murder	3	....	1	1	....	....	1	1	....	1	....	2	10
Myelitis	....	1	....	3	2	1	1	1	....	....	1	....	10
Myo Carditis	....	1	....	....	....	....	....	....	....	....	....	....	1
Miscarriage	....	....	....	....	....	....	1	....	....	....	....	....	1
Malaria	....	....	....	....	....	....	1	....	....	....	....	....	1
Neurasthenia	1	2	3	....	1	1	....	1	1	3	1	2	16
Necrosis	2	2	....	....	1	....	....	....	....	....	....	1	6
Neuralgia	1	....	....	....	....	....	....	....	....	....	....	....	1
Nutmeg Liver	....	....	1	....	....	....	....	....	....	....	....	....	1
Non Viable	....	....	1	....	....	....	1	....	....	....	....	....	2
Old Age	34	23	35	19	25	35	24	21	30	25	16	31	318
Oedema of Lungs	1	1	....	2	....	....	....	....	....	....	....	....	4
" of Glottis	....	....	1	....	....	....	....	1	....	....	....	....	2
Overlaid	1	....	....	....	....	....	....	....	....	....	....	....	1
Ovariotomy	1	1	....	....	....	....	...	....	....	....	....	....	2
Opium Habit	....	....	....	....	1	....	....	....	....	....	....	1	2
Over Lactation	....	....	....	....	....	....	....	....	1	....	....	....	1
Puerperal Metritis	2	....	....	....	....	....	....	....	....	....	....	....	2
" Septicæmia	3	2	3	....	1	2	....	3	....	1	1	....	16
" Mania	1	....	....	....	....	....	...	....	....	....	....	....	1
" Peritonitis	1	1	2	2	2	5	1	2	....	....	1	1	18
Paralysis	16	12	21	13	10	22	12	14	10	14	10	15	169

TABLE NO. 1—continued.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Pneumonia	87	100	119	64	46	33	12	16	24	30	56	84	671
" Typhoid	2	1	6	3	2	1	....	2	1	1	....	5	24
" Pleuro	4	2	5	....	3	2	2	....	....	2	1	1	22
" Broncho	2	4	3	4	3	1	1	2	1	1	....	1	23
Poison	1	1	....	....	1	1	1	....	1	....	....	....	6
Premature Birth	7	10	12	12	16	25	23	16	16	17	12	22	188
Pyæmia	1	....	....	2	1	....	1	....	2	2	....	....	9
Pott's Disease	1	....	1	....	....	....	....	....	....	....	....	....	2
Prolonged Labor	3	1	2	2	..	1	1	....	....	1	....	2	13
Perrigo Larvalis	1	....	....	....	....	....	....	....	....	....	....	....	1
Purpura	1	....	....	....	....	....	....	....	....	....	....	....	1
Prostititis	....	1	....	....	....	....	....	....	....	....	....	....	1
Progressive Locomotive Ataxia	....	1	....	....	....	....	....	3	....	....	2	....	6
Phlebitis	....	....	....	1	....	....	....	....	....	....	....	....	1
Parotiditis	....	....	....	....	1	....	....	....	....	....	....	....	1
Pelvic Cellulitis	....	....	....	....	....	1	....	1	....	....	....	....	2
Phrenitis	....	....	....	....	....	....	....	....	....	1	....	....	1
Pemphigus	....	....	....	....	....	....	....	....	....	....	1	....	1
Rheumatism	4	1	7	5	....	1	1	....	....	1	1	1	22
" Inflammatory	2	2	3	3	2	2	4	3	1	1	1	....	23
Rachitis	1	....	....	....	....	....	....	....	....	....	....	....	1
Surgical Kidney	1	....	....	....	....	....	....	....	....	....	....	....	1
Spinal Sclerosis	1	....	....	....	....	....	....	....	....	....	....	....	1
Stomatitis	1		2	....	....	....	2	1	....	....	1	1	9

Scrofula	1	1	4	....	1	4	3	1	4	2	1	3	25
Softening of Brain	2	5	3	2	2	1	3	2	6	1	5	4	36
Sciatica	1	....	....	....	....	....	....	....	....	....	....	....	1
Suicide	6	1	....	3	5	4	3	4	2	2	....	5	35
Syphilis	1	1	3	2	4	2	2	....	2	....	....	1	18
Smothered in Bed	....	1	....	....	....	....	....	....	....	....	....	....	1
Septicæmia	....	1	3	....	....	....	....	1	....	....	....	1	6
Stricture of Rectum	....	1	....	....	....	....	....	....	1	....	....	....	2
" of Bowels	....	....	2	....	3	2	3	2	1	....	2	1	16
" of Oesophagus	....	....	....	1	....	....	....	....	....	....	....	....	1
" of Urethra	....	....	....	....	....	2	....	....	....	....	....	....	2
Spina Bifida	....	....	2	....	....	....	....	....	....	4	....	2	5
Sclerosis of Brain	....	....	1	....	....	....	....	....	....	....	....	....	1
Suffocation by Illuminating Gas	....	....	1	....	....	....	....	....	....	3	....	3	7
" by Stone in Throat	....	....	....	....	1	....	....	....	....	....	....	....	1
" by Foul Air	....	....	....	....	....	....	1	....	....	....	....	....	1
" by Coal Gas	....	....	....	....	....	....	....	....	....	....	....	1	1
Sunstroke	....	....	....	....	....	....	....	6	....	....	....	....	6
Suppurative Ovaritis	....	....	....	....	....	....	....	....	....	....	1	....	1
Scalds	....	....	....	....	....	....	....	....	....	....	....	2	2
Tumor Ovarian	3	1	2	....	....	....	....	2	....	3	....	3	14
" of Kidney	1	....	....	....	....	....	....	....	....	....	....	....	1
" of Brain	....	1	1	....	1	....	....	....	....	2	1	....	6
" of Abdomen	....	....	....	....	....	....	....	1	....	2	1	1	5
" of Spleen	....	....	....	....	....	....	....	....	....	1	....	....	1
" of Stomach	....	....	....	....	....	....	....	....	....	....	1	....	1
Tuberculosis of Spine	1	....	....	....	....	....	....	....	....	....	....	....	1
Tetanus	1	2	2	....	1	1	1	3	4	....	2	....	17
Trismus Nascentum	3	2	4	5	4	1	4	6	6	6	1	2	44
Tabes Mesenterica	....	1	1	2	....	2	2	1	3	....	1	1	14
Typhilitis	....	....	....	....	....	1	....	....	....	....	1	2	4
Tumor of Liver	....	....	....	....	....	....	....	....	....	....	1	....	1
Ulcer of Stomach	1	1	....	....	1	2	....	3	2	1	....	....	11
" of Bowels	1	....	....	....	....	....	1	....	....	....	....	....	2

TABLE No. 1—concluded.

CAUSES OF DEATH.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Ulcer of Rectum	....	....	1	....	....	....	....	....	....	....	....	....	1
" of Leg	....	....	....	....	....	....	1	1	....	....	....	....	2
" Chronic	....	....	1	....	....	....	....	....	....	....	....	....	1
Vesicular Emphysema	....	....	....	....	....	....	....	....	....	....	....	1	1
Uræmia	2	1	1	1	2	3	1	1	....	4	1	....	17
Unknown, Adults	....	....	1	....	1	1	....	....	....	....	....	....	3
" Infants.	3	....	2	1	....	1	....	2	2	....	1	2	14
Wounds, Lacerated Tongue	....	....	....	....	....	....	....	....	....	....	1	....	1
" Lacerated Scalp	....	....	....	....	....	....	....	....	....	....	....	1	1
Whooping Cough	7	13	18	11	5	2	11	10	9	11	10	5	112
Wounds, Crushed	2	....	....	....	1	5	1	....	2	1	1	1	14
" Fall	1	2	5	1	1	3	2	1	....	1	....	3	20
" Pistol Shot	....	1	1	....	....	....	....	....	....	....	....	3	5
" R. R. Cars	....	1	1	4	1	....	3	....	....	1	3	2	16
" of Groin	....	....	1	....	....	....	....	....	....	....	....	....	1
" by Fall of Building	....	....	....	....	....	....	....	....	7	....	....	....	7
" Crushed Foot	....	....	....	....	....	....	....	....	....	....	1	....	1
Grand Total	642	711	952	620	544	874	967	893	813	601	539	780	8936

TABLE No. 2.

160. Ages and Nativity of Decedents.

AGES—1888.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	GRAND TOTAL.
Under 1 year..................	145	137	224	117	127	325	482	333	293	144	102	195	2,624
Between 1 and 2 years............	58	57	97	69	40	76	93	74	62	46	39	39	787
“ 2 “ 5 “	52	59	65	50	30	26	32	38	21	27	32	38	470
Total, under 5 years............	255	253	386	236	197	427	590	464	388	233	180	272	3,881
Between 5 and 10 years..........	20	33	38	29	26	27	35	21	24	29	25	38	345
“ 10 “ 15 “	9	7	15	8	6	14	14	18	15	8	8	9	131
“ 15 “ 20 “	15	23	26	19	17	23	21	23	27	10	20	30	254
“ 20 “ 30 “	51	60	84	56	48	68	55	78	56	67	50	69	742
“ 30 “ 40 “	55	75	74	54	51	62	42	64	61	48	56	73	715
“ 40 “ 50 “	54	52	72	42	47	57	40	56	59	45	54	67	645
“ 50 “ 60 “	52	58	74	60	41	56	36	53	56	41	54	63	644
“ 60 “ 70 “	62	77	77	58	51	66	62	60	63	67	50	75	768
“ 70 “ 80 “	47	45	73	35	35	45	49	37	40	25	28	51	510
“ 80 “ 90 “	18	24	27	18	23	23	22	18	20	26	12	31	262
“ 90 “ 100 “	4	3	4	2	2	5	1	1	3	2	2	2	31
“ 100 “ 110 “	....	1	2	3	....	1	....	....	1	...	....	......	8
Above 110 years................	....	....	....	....	....	....	....	....	....	....	....	......	......
Totals	642	711	952	620	544	874	967	893	813	601	539	780	8,936

NATIVITY.													
U. S.—White Males	191	215	278	194	163	269	330	286	252	179	169	233	2,759
" " Females	177	206	258	169	147	265	297	290	255	171	141	220	2,596
Foreign—White Males	68	59	91	57	55	84	61	86	70	59	49	80	819
" " Females	60	65	82	41	55	60	54	59	64	57	58	65	720
Colored Males	58	80	125	72	64	92	114	80	92	66	54	91	988
" Females	88	86	118	87	60	104	111	92	80	69	68	91	1,054
Totals	642	711	952	620	544	874	967	893	813	661	539	780	8,936
Still-births	60	54	69	46	36	72	54	60	67	60	57	59	694
Marriages	385	336	289	398	385	370	272	280	378	425	430	442	4,390
Births (reported)	668	687	849	562	461	749	687	852	825	799	728	858	8,725

Population estimated by Police Census, 500,343—White, 423,782; colored, 76,561. Total, 500,343. Total mortality during the year, 8,936; United States—White, 5,355; foreign, 1,539; colored, 2,042. Total, 8,936. Annual death-rate per 1,000 whole population, 17.87; white, 16.26; colored, 26.50. Total births (reported), 8,725; birth-rate per 1,000 population, 17.45. Total marriages, 4,390; marriage-rate per 1,000 population, 8.78. Total still-births, 694.

TABLE NO. 3.

161. Monthly Death Record in Each Ward.

WARDS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
First	37	34	48	29	26	48	59	53	44	28	26	39	471
Second	35	33	51	32	33	36	46	74	37	37	24	34	472
Third	32	36	44	23	17	39	32	30	42	24	27	30	376
Fourth	42	33	30	26	22	46	34	27	34	20	12	29	355
Fifth	24	29	49	22	24	28	34	34	34	18	15	39	350
Sixth	38	43	58	36	33	52	59	53	51	31	43	41	538
Seventh	31	50	54	33	24	43	45	48	50	32	34	36	480
Eighth	33	51	70	42	34	44	39	33	41	28	24	36	475
Ninth	27	32	49	29	25	44	41	28	34	22	24	33	388
Tenth	37	31	32	26	27	30	28	22	21	24	17	24	319
Eleventh	16	20	38	26	34	45	32	21	25	16	23	36	332
Twelfth	43	36	60	58	40	57	74	61	49	37	27	50	592
Thirteenth	29	30	43	26	25	28	33	43	32	20	21	31	361
Fourteenth	30	26	37	33	28	46	54	42	35	28	30	29	418
Fifteenth	36	31	46	30	24	44	34	30	24	33	25	30	387
Sixteenth	27	24	44	23	16	24	31	24	32	19	20	33	317

Seventeenth	31	53	40	16	22	52	46	56	40	41	15	47	459
Eighteenth	28	33	48	34	37	46	75	75	44	35	42	43	540
Nineteenth	38	45	52	40	30	34	40	44	44	28	26	33	454
Twentieth	28	41	59	36	23	41	39	36	46	26	22	22	440
Twenty-first	....	....	....	....	....	15	48	35	24	31	15	31	199
Twenty-second	...	....	....	...	....	32	44	24	30	23	27	33	213
Totals	642	711	952	620	544	874	967	893	813	601	539	780	8,936

TABLE NO. 4.

162. Monthly Record of Births.

BIRTHS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
White Males....................	263	289	387	256	199	325	321	396	356	343	342	377	3854
White Females.............	283	303	345	228	191	322	280	337	368	331	300	358	3646
Total.....................	549	592	732	484	390	647	601	733	724	674	642	735	7500
Colored Males................ ...	56	48	67	45	28	52	42	65	62	68	46	63	642
Colored Females...	66	47	50	33	43	50	44	54	39	57	40	60	583
Total.....................	122	95	117	78	71	102	86	119	101	125	86	123	1225
Illegitimate White................	8	9	15	8	7	11	15	18	10	11	7	15	134
Illegitimate Colored	20	13	24	14	19	20	10	19	19	26	15	21	220
Total Illegitimate..........	28	22	29	22	26	31	25	37	29	37	22	36	354

A. R. CARTER, *Secretary Health Department.*

Table No. 5.

163. Deaths from Zymotic Diseases, &c.

Quarter ending March 31, 1888.

Zymotic Diseases.	Wards.																				Totals.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Croup	4	2	7	2	4	2	3	1	..	..	1	1	3	4	1	3	..	5	5	2	50
Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cholera Infantum	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
" Morbus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Diphtheria	2	..	..	1	..	1	..	2	1	2	..	1	2	1	..	1	1	2	..	3	20
Diarrhœa	..	3	..	..	1	..	1	1	3	..	..	3	..	1	2	..	..	..	1	2	18
Dysentery	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	1	4
Entero Colitis	..	1	..	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	4
Erysipelas	..	..	..	2	..	1	..	..	..	..	1	..	1	..	..	..	3	..	1	1	10
Fever, Cerebro Spinal	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	2	1	1	..	6
" Intermittent	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
" Malarial	4	..	..	..	1	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	8
" Puerperal	1	..	..	..	..	..	..	1	1	..	..	..	..	1	2	..	..	..	..	..	6
" Remittent	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	3
" Scarlet	1	3	..	..	2	..	..	..	..	2	..	..	..	..	1	1	1	1	1	1	14
" Typhoid	1	..	2	2	1	..	3	..	1	1	..	1	..	2	..	..	2	1	1	3	21
" Typhus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
" Typho-Malarial	..	3	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	6

Measles	9	7	5	3	9	12	9	9	..	..	2	1	1	2	5	7	4	6	7	7	105
Pyæmia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
Small Pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	...
Septicæmia	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	1	..	1	4
Tonsilitis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Varicella	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Whooping Cough	..	2	3	2	..	4	..	4	..	2	1	4	..	2	2	2	4	..	5	1	38
Total Zymotic Diseases	22	22	17	12	18	25	19	20	9	7	5	11	7	14	14	18	17	17	24	22	320
Consumption	15	9	16	13	14	16	21	25	18	19	12	23	13	9	21	15	14	15	21	18	327
Pneumonia	8	27	10	10	21	21	15	29	18	15	10	18	14	10	14	12	35	15	17	16	335

TABLE No. 5—continued—Quarter ending June 30, 1888.

ZYMOTIC DISEASES.	WARDS.																						TOTALS.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Croup	1	2	..	1	1	..	4	1	..	1	..	1	1	1	1	..	1	1	1	1	..	1	20
Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cholera Infantum	14	5	5	9	..	18	8	4	5	4	7	7	4	3	11	3	14	13	6	3	2	3	148
" Morbus	1	..	..	1	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	..	1	..	6
Diphtheria	..	..	1	3	..	1	..	..	1	..	1	..	..	..	2	..	1	..	1	1	..	..	12
Diarrhœa	1	2	..	1	..	..	1	2	..	..	1	..	..	1	1	1	..	2	2	..	3	..	18
Dysentery	..	..	2	..	..	..	..	..	..	..	3	1	..	2	3	..	2	2	1	1	2	..	19
Entero Colitis	..	..	..	1	..	1	..	..	2	..	..	..	..	..	..	..	1	..	..	..	1	..	6
Erysipelas	1	..	..	..	1	..	..	1	..	..	..	2	..	..	1	..	..	..	..	..	..	..	6
Fever, Cerebro Spinal	..	..	..	..	..	1	1	..	..	..	..	2	1	..	..	..	..	1	..	..	..	1	7
" Intermittent	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
" Malarial	1	..	..	..	..	3	1	..	1	..	..	1	..	..	..	1	..	1	..	1	..	..	10
" Puerperal	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3
" Remittent	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2
" Scarlet	..	1	..	2	1	1	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	7
" Typhoid	2	1	..	..	1	..	1	1	..	1	..	2	1	2	2	1	..	1	..	4	..	1	21
" Typhus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
" Typho-Malarial	..	1	..	1	..	1	..	1	..	1	..	..	..	..	1	..	..	..	..	..	..	..	6

Measles	2	2	1	3	3	3	1	4	2	6	1	9	4	4	..	3	1	1	5	6	..	1	62
Pyæmia	..	..	..	1	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	3
Small Pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Septicæmia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Tonsilitis	..	..	..	..	..	..	..	..	..	..	..	..	..	..	.	..	..	1	1	..	..	..	2
Varicella	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Whooping Cough	..	..	..	1	..	1	..	5	1	1	..	1	..	2	2	2	..	..	..	2	..	..	18
Total Zymotic Diseases	23	14	10	2	8	30	19	19	12	15	13	27	12	17	25	12	20	23	17	19	9	7	377
Consumption	8	9	15	11	10	20	16	19	18	11	17	30	10	24	13	9	11	17	14	13	..	1	296
Pneumonia	9	17	2	6	6	8	7	3	2	4	6	13	7	7	7	11	10	13	8	13	..	3	162

TABLE No. 5—continued—Quarter ending September 29, 1888.

ZYMOTIC DISEASES.	WARDS.																						TOTALS.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Croup	1	1	..	1	..	..	..	..	..	..	..	..	1	..	..	1	1	1	..	..	1	1	9
Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cholera Infantum	47	56	18	19	12	30	16	14	12	11	10	26	12	25	21	13	37	40	18	16	20	19	492
Cholera Morbus	2	1	2	..	2	2	3	1	..	1	1	2	..	..	1	..	..	..	..	1	..	2	21
Diphtheria	1	..	3	2	..	2	1	..	.	1	..	1	..	2	..	..	3	3	3	..	1	2	25
Diarrhœa	4	8	1	2	5	2	6	4	2	2	3	6	2	5	2	5	2	8	6	7	1	5	88
Dysentery	7	2	2	4	4	6	9	4	9	4	4	17	5	1	3	4	4	5	5	13	12	..	124
Entero Colitis	3	..	..	2	3	2	4	2	3	2	3	6	..	1	..	1	1	5	2	3	2	3	48
Erysipelas	..	..	..	1	..	3	..	..	..	1	..	1	..	1	..	..	1	..	..	..	..	..	8
Fever, Cerebro Spinal	1	..	..	..	..	1	1	..	..	..	..	1	1	1	..	..	..	..	..	..	..	..	6
" Intermittent.	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	3
" Malarial	1	1	1	..	2	..	1	2	1	..	..	2	..	1	..	2	3	..	..	..	..	..	17
" Puerperal	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	3
" Remittent	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	3	..	..	..	..	..	5
" Scarlet	1	..	..	..	..	1	2	..	1	..	..	..	..	..	..	..	..	1	..	1	..	..	7
" Typhoid	3	..	2	3	1	2	7	4	3	2	4	2	9	..	3	3	2	5	2	1	2	4	64
" Typhus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
" Typho-Malarial	2	3	..	..	..	2	..	..	..	..	..	..	..	..	..	..	3	2	1	1	..	..	14

Measles	..	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	1	..	..	7
Pyæmia	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	..	..	..	..	3
Small Pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Septicæmia	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Tonsilitis	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	2
Varicella	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Whooping Cough	1	..	..	..	2	..	2	..	1	..	..	1	3	3	..	3	2	3	6	1	1	1	30
Total Zymotic Diseases	74	77	29	35	32	53	53	31	33	24	25	66	34	40	31	32	63	78	44	46	40	37	977
Consumption	11	9	3	8	16	16	10	14	3	11	11	22	8	24	13	7	8	17	9	13	9	11	253
Pneumonia	3	3	1	3	1	4	2	5	2	1	1	4	2	7	1	2	4	6	3	4	1	1	61

TABLE No. 5—continued—Quarter, ending December 29, 1888.

ZYMOTIC DISEASES.	WARDS.																						TOTALS.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Croup	4	1	..	..	..	..	..	1	1	..	..	1	1	1	1	..	1	..	1	1	1	4	19
Cholera	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Cholera Infantum	..	3	..	..	1	1	1	1	..	1	..	..	..	..	..	1	..	3	1	1	..	..	14
" Morbus	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	2
Diphtheria	4	..	..	1	1	1	6	1	..	..	1	3	2	3	3	..	8	7	1	1	10	8	61
Diarrhœa	1	3	..	3	1	..	1	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	12
Dysentery	2	3	..	..	..	2	1	2	1	1	..	..	..	1	2	1	1	..	..	2	1	..	20
Entero Colitis	..	1	..	..	1	1	..	1	..	1	..	..	1	..	..	..	..	..	1	1	..	..	8
Erysipelas	1	..	..	..	..	1	..	..	1	..	..	..	..	..	1	1	..	..	1	..	..	..	6
Fever—Cerebro Spinal	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..	..	..	3
" Intermittent	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2
" Malarial	..	2	..	..	..	2	1	..	..	1	..	..	..	..	2	..	..	2	..	..	..	..	10
" Puerperal	..	1	1	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
" Remittent	1	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	2	..	..	..	1	7
" Scarlet	1	..	..	..	..	2	4	5	..	..	..	..	..	..	..	..	1	2	1	..	..	..	16
" Typhoid	5	1	2	..	3	2	5	1	..	1	3	5	1	3	..	3	4	2	4	2	4	5	55
" Typhus	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
" Typho-Malarial	1	1	..	..	..	2	3	..	..	1	1	1	..	..	1	1	1	1	..	1	..	..	15

Measles	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2
Pyæmia.	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2
Small Pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....
Septicæmia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1
Tonsilitis	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Varicella.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	...
Whooping Cough	1	5	..	1	2	3	..	..	2	1	..	1	2	2	2	1	..	1	..	1	..	1	26
Total Zymotic Diseases	21	24	3	5	9	18	23	14	6	8	7	11	7	10	15	10	17	20	12	12	16	19	287
Consumption	14	6	11	12	15	13	18	12	11	9	11	14	12	14	16	12	15	11	14	14	8	13	275
Pneumonia.	11	11	7	6	5	11	5	10	9	2	6	12	6	5	13	11	10	11	11	5	5	10	182

TABLE No. 5—concluded—Year ending December 29, 1888.

ZYMOTIC DISEASES.	WARDS.																						TOTALS.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
Croup	10	6	7	4	5	2	7	3	1	1	1	3	6	6	3	1	6	7	7	4	2	6	98
Cholera	...	...	..	..	..	...	...	..	..	..	..	...	..	..	..	..	...	...	..	.	..	..	....
Cholera Infantum	61	64	23	28	13	49	25	19	17	16	17	33	16	28	32	17	51	56	25	20	22	22	654
" Morbus	3	1	2	1	2	2	4	1	1	1	2	3	..	..	1	1	...	...	1	1	1	2	30
Diphtheria	5	...	6	7	1	5	7	3	2	3	2	5	4	6	5	1	13	12	5	11	10	10	118
Diarrhœa	6	16	1	6	7	2	9	7	5	2	4	9	2	7	6	6	2	10	9	11	4	5	136
Dysentery	9	6	4	4	4	9	10	6	10	5	7	18	5	4	8	6	7	7	6	17	15	..	167
Entero Colitis	3	2	..	3	4	4	5	3	7	3	3	6	1	1	..	1	2	5	3	4	3	3	66
Erysipelas	2	...	..	3	1	5	...	1	1	1	1	3	1	1	2	1	4	...	2	1	..	..	30
Fever, Cerebro Spinal	1	...	..	..	..	3	3	..	..	..	1	3	2	1	..	1	3	2	1	..	..	1	22
" Intermittent	...	1	..	2	..	...	..	..	..	..	..	...	..	1	..	..	...	1	2	..	..	..	7
" Malarial	6	3	1	..	3	6	3	3	2	1	..	3	..	1	2	4	3	3	..	..	..	1	45
" Puerperal	1	2	1	1	1	...	2	2	1	..	..	...	..	1	2	..	..	1	..	1	..	..	16
" Remittent	1	...	1	..	1	...	...	1	..	1	..	.	..	1	3	2	3	2	..	..	..	1	17
" Scarlet	3	1	..	5	3	4	6	5	1	2	..	...	..	1	2	1	2	4	2	2	..	..	44
" Typhoid	11	2	6	5	6	4	16	6	4	5	7	10	11	6	5	6	9	9	7	10	6	10	161
" Typhus	...	...	..	..	..	..	...	..	..	..	..	...	..	..	..	..	...	...	..	..	..	..	....
" Typho-Malarial	3	8	..	1	..	7	4	1	..	2	1	1	..	..	2	1	4	3	1	2	..	..	41

Measles	11	13	6	6	12	15	10	14	2	6	3	10	5	6	5	10	6	8	13	14	..	1	176
Pyæmia	1	...	..	1	..	..	...	..	..	1	..	1	2	1	..	..	...	1	1	..	..	..	9
Small Pox	..	...	..	..	..	..	...	..	..	..	..	..	..	..	..	..	...	...	..	..	..	..	...
Septicæmia	...	...	..	..	..	...	1	..	1	..	..	...	..	..	1	1	...	1	..	1	..	..	6
Tonsilitis	...	1	..	..	..	1	...	..	1	..	..	...	..	..	..	..	..	2	1	..	..	..	6
Varicella	...	...	..	..	..	...	...	..	..	..	.	...	..	..	..	..	...	...	..	..	.	..	....
Whooping Cough	2	7	3	4	4	8	2	9	4	4	1	7	5	9	6	8	6	4	11	5	1	2	112
Total Zymotic Diseases	139	134	61	81	67	126	114	84	60	54	50	115	60	81	85	68	121	138	97	98	65	64	1961
Consumption	48	33	45	44	55	65	65	70	50	50	51	89	43	71	63	43	48	60	58	58	17	25	1151
Pneumonia	31	58	20	25	33	44	29	47	31	22	23	47	29	29	35	36	59	45	39	38	6	14	740

TABLE NO. 6.

164. Longevity of Decedents.

WHITE MALES—*Aged* 70 *Years.*

Mr.	Thos. McLaughlin	70
“	Amos Frankforter	70
“	John A. W. Pearce	70
“	Wolfgang Van Torn	70
“	John A. Irvin	70
“	C. G. Wilkennig	60
“	Brother Justinian	70
“	Jacob Green	70
“	Wm. H. Heller	70
“	Frederick Dollenger	70
“	Patrick Glenn	70
“	Leroy Ross	70
“	Elmer Hewitt	70
“	Sebastian Imhoff	70
“	Lucas Werneth	70
Dr.	Henry G. Bussey	70
Mr.	Nison Frank	70
“	John Leppert	70
“	Lloyd M. Peters	70
“	Samuel Banks, Sr	70
“	Samuel Herpig	70
“	Patrick McEntie	70
“	Daniel Horrigan	70
“	Edward Bushell	70
“	Joseph Starlack	70
Capt.	Geo. W. Foxwell	70

WHITE MALES—*Aged* 71 *Years.*

Mr.	Wolfgang Wittman	71
Capt.	John L. Gibson	71
Mr.	M. W. C. Thompson	71
“	Geo. W. Lewis	71
“	Edward Hutson	71
“	C. Eigenbrodt	71
“	John T. Gardner	71
“	Andrew Schneider	71
“	James A. Hayes	71
“	J. S. Molherhead	71
Mr.	John A. Franck	71
“	Francis Smith	71
“	Jeremiah Jones	71
“	Jacob Herzberg	71
“	William Madders	71
“	David A. Yerkes	71
“	Jesse Taylor	71
“	Richard Berry	71
“	John F. Hutton	71
“	Elias Bowvtche	71
“	W. H. Huttenberger	71
“	Peter C. Marguie	71
“	Nicholas Gill	71
“	John Bishop	71
“	Benjamin O'Hara	71
“	George Funk	71

WHITE MALES—*Aged* 72 *Years.*

Mr.	John N. Schaab	72
“	James Fields	72
“	James L. Thomas	72
“	John H. Thiemyer	72
“	Conrad Thim	72
“	Andrew Byrne	72
“	Evan P. Coulter	72
“	N. F. Blacklock	72
“	John H. Kiel	72
“	Joseph S. Cromwell	72
“	Michael Muller	72
“	George L. Bower	72
“	William Hipkins	72
“	William H. Gray	72
“	William Stansbury	72
“	Jesse M. Cullison	72
“	M. Abrams	72
“	Thomas Neal	72

WHITE MALES—*Aged* 73 *Years.*

Mr.	David McClain	73
“	W. T. Severe	73

TABLE NO. 6—continued.

Mr. James McDougel	73
“ James Dwyer	73
“ J. J. Robinson	73
“ John Simpson	73
“ David Stern	73
“ Alexander Bradley	73
“ John A. Jenney	73
“ F. T. Meisenhalter	73
“ Simon Meyer	73
“ Timothy Albrecht	73
“ John Miller	73
Dr. Dr. Robert F. Neely	73
Mr. Joseph Domling	73
“ Jacob Reader	73
Rev. J. S. Martin, D. D	73
Mr. John Russ	73
“ William D. Shurtz	73
“ James McDonnell	73
“ Bernard Duffy	73
“ James McDonnell	73
“ William Rothrock	73
“ Joseph R. Manaca	73
“ George Malter	73
“ Elisha Karr	73
“ John F. Tauber	73
“ H. D. Rhinehardt	73
“ James Reid	73
Capt. Alexander Tyler	73
Mr. John Reus	73
“ John Hays	73

WHITE MALES—*Aged* 74 *Years.*

Capt. Gassaway Tucker	74
Mr. Moritz Helb	74
“ John North	74
“ Samuel D. Reed	74
“ Wm. H. Collins	74
“ Alexander Reiman	74
“ Mendel Stiebel	74
“ Isaac Noblet	74
“ Simon Hilb.	74
“ Wm. H. Collins	74
“ John Piercy	74
“ Joseph M. Hooper	74
“ Jacob Forrest	74
Mr. William Ritter	74
“ Meyer Salabis	74
“ Wm. Coulter	74
“ Christian Bole	74
“ Thomas Rottman	74

WHITE MALES—*Aged* 75 *Years.*

Mr. Thomas Browne	75
“ George M. Kruger	75
“ George Frainer, Sr.	75
“ John W. Krupps	75
“ Charles Chambers	75
“ George Arthur	75
“ Richard P. Smith	75
“ John Wile	75
“ Marcus Adler	75
“ Nelson Rozier	75
“ Adam Suchs	75
“ Joseph Clendennin	75
“ William White	75
“ William Shannon	75
“ James Deaver	75
“ J. H. Kalbelege	75
“ Henry Vanlill	75
“ Geo. W. Howard	75
“ Wilhelm Roscher	75

WHITE MALES—*Aged* 76 *Years.*

Lieut. Wm. A. Bailey	76
Mr. Frederick Simmont	76
“ Michael Grenzer	76
“ John Thomson	76
“ Joseph Lamb	76
“ Alfred McLane	76
“ Isaac Hartman	76
“ John F. P. Jensen	76
“ Philip A. Smick	76
“ Michael Jones	76
“ Andrew Heasey	76
“ William Raabe	76
Dr. William T Jones	76
Mr. John N. Pritchard	76
“ Lawrence L. Gilder	76
“ John Chambers	76
“ Thomas Penn	76

TABLE NO. 6—continued.

Mr. Andrew Weinkam	76
“ Charles Cannoles	76
“ John Hingham	76

WHITE MALES—*Aged* 77 *Years.*

Dr. Elisha H. Perkins	77
Mr. Malachi Blondell	77
“ John Wepler.	77
“ Ludwig Johns	77
“ Jonas Goldsmith	77
“ C. C. Hinman	77
“ Thomas Kuebler	77
“ Andrew Utz	77
“ Jacob Brunner	77
“ Gabriel Hitchcock	77
“ James Neill	77
“ Henry Decker	77
“ Joseph G. Monroe	77
“ Anthony Dausch	77
“ Thomas Adler	77
“ Balsal Wagner	77
“ H. H. Barlage	77
“ John M. Wahl	77
“ Joseph Y. Ford	77
“ Louis Baumgarten	77
“ Ernest W. Plack	77
“ James Foreman	77
“ John Roder	77

WHITE MALES—*Aged* 78 *Years.*

Captain Wm. Hubbard	78
Mr. Robert Lumsden, Sr	78
“ John Shannahan	78
“ John B. Hand	78
“ Samuel B. Hopkins	78
“ William D. Miller	78
“ Wm. Hengemuihle	78
“ Philip Emerich	78
“ John W. Wilson	78
“ John Gruckart	78
“ Henry Most	78
“ Henry M. Rowe	78
“ Lewis Turner	78
“ Thomas Quinn	78
“ James S. Leary	78
Mr. William Ball	78
“ Andrew Schneider	78
“ Louis Schaub.	78
“ Henry E. Huber	78
“ Joseph Eldridge	78
“ John Mullen	78
“ John T. Murray	78
“ John Schultheis	78
“ James G. R. Taylor	78

WHITE MALES—*Aged* 79 *Years.*

Rev. Edward J. Sourin	79
Mr. D. Schillinberg	79
“ Alex. McKenzie	79
“ J. C. A. Smith	79
“ F. W. Burkamp	79
“ John G. Bitters	79
“ Herman Peltzer	79
“ Barth Sessel	79
“ Richard Share	79
“ Robert S. Murray	79
“ Michael Cornell	79
“ Scott Hughes	79
“ Wm. Meeks	79
“ Wm. Carmichael	79
“ John C. Brough	79
“ August Wiekel	79
“ G. Schwarzenberger	79
“ Geo. F. R. Waische	79
“ Jacob Walschmidt	79

WHITE MALES—*Aged* 80 *Years.*

Mr. Francis J. Robinson	80
“ Michael Daniel	80
“ James Adams	80
“ Henry C. Winkee	80
“ Luke Cassiday	80
“ Christian H. Meyer	80
“ Michael C. Kolb	80
“ James M. Brown	80
“ Sam'l Landauer	80
“ Henry Ritbmiller	80
“ Wm. Heisterman	80
“ Thomas S. Clark	80
“ Theodore Geilfus	80
Rev. W. B. Edwards, D.D	80

TABLE No. 6—continued.

WHITE MALES—*Aged* 81 *Years.*

Mr. John Mark	81
" Jesse J. Amos	81
" Stephen Bridge	81
" Patrick Shortell	81
" Charles Meier	81
" John M. Weimar	81
" Andrew Koehner	81
" George Bond	81
" James Welsh	81
" Aug. Wolfangel	81
" Gerhart H. Reipe	81
" Chas. E. Wethered	81
" Wm. A. McLanahan	81

WHITE MALES—*Aged* 82 *Years.*

Mr. A. S. Abell	82
" Austin Jenkins	82
" Adam Gehring	82
" Adam Wentzell	82
" Andrew Meyer	82
" John Malcahy	82
" Henry Kness	82
" Fred. Schultz	82
" John Moran	82
" Wm. Meehann	82
" Sam'l Suckers	82
" E. W. Dukehart	82
" William Wallace	82
Prof. W. E. A. Aiken, M.D.	82
Capt. Wm. Costigan	82

WHITE MALES—*Aged* 83 *Years.*

Mr. Conrad Schafer	83
" Adam Dickhart	83
" David Hess	83
" Adam Walter	83
" John F. Barringer	83
" William Gent	83
" John Stephenson	83
" Owen Cassiday	83
" John Kircher	83
Dr. Ferd. E. Chatard	83
Mr. Selar Barton	83
" T. J. Wentworth	83
" Joseph Abinskion	83

WHITE MALES—*Aged* 84 *Years.*

Mr. Peter Miller	84
" Sam'l Rozenstock	84
" Thomas W. Levering	84
" John Hancocks	84
" George Rupp	84
" Jacob Houck	84
" John Annan	84
" A. Kaufman	84
" Thomas Kenney	84
" Victor Diffy	84

WHITE MALES—*Aged* 85 *Years.*

Mr. Henry J. Powell	85
" Nathan Meyers	85
" Thomas Bawn	85
" Charles Davidson	85
" John Gorland	85
" Stephen Simmonds	85
" Christian Fungling	85
" William Schaum	85
" J. J. Cunningham	85

WHITE MALES—*Aged* 86 *Years.*

Gen. Isaac R. Trimble	86
Mr. David McGall	86
" Richard Taylor	86
" Christian C. Linck	86
" J. V. Horn	86

WHITE MALES—*Aged* 87 *Years.*

Judge John K. Carroll	87
Mr. Samuel Phillips	87
" James Rial	87
" Sam'l J. Garrison	87
" Cobie Lanahan	87
" Christian Nighoff	87
" Joseph Blum	87
" Martin N. Cooney	87
" Luke Kendall	87
" Fred'k Lindenberg	87

WHITE MALES—*Aged* 88 *Years.*

Mr. John H. Cook	88
" Patrick O'Grady	88
" Wm. G. Wetherall	88
" John Gartride	88

TABLE NO. 6—continued.

WHITE MALES—*Aged* 89 *Years.*

Mr. Edward Coleman	89
" Thomas Mules	89
" Henry Bibie	89
" John Conroy	89
" James Quinn	89

WHITE MALES—*Aged* 90 *Years.*

Mr. Arch. Stirling, Sr.	90

WHITE MALES—*Aged* 91 *Years.*

Mr. Jacob Miller	91

WHITE MALES—*Aged* 92 *Years.*

Mr. Leppman Hoffman	92

WHITE MALES—*Aged* 93 *Years.*

Mr. Nathaniel Watts	93
" James C. Morford	93

WHITE MALES—*Aged* 97 *Years.*

Mr. Wm. G. Tankersly	97

WHITE MALES—*Aged* 98 *Years.*

Mr. Jacob Hemmick	98

WHITE MALES—*Aged* 109 *Years.*

Mr. Bernard Reily	109

WHITE FEMALES—*Aged* 70 *Years.*

Miss Julia Riley	70
Mrs. Mary Burke	70
" Elizabeth Reed	70
" Elizabeth F. Taylor	70
" Elizabeth Bauer	70
" Elizabeth J. McClure	70
" Eliza S. Maughn	70
" Catharine Dudley	70
" Catharine F. Baum	70
" C. H. Barthy	70
" Sarah A. Price	70
" Sarah J. Fennel	70
" Rossina Kirby	70
" Clansey Bartel	70
" Julia A. Meyer	70
" Susan Jones	70
" Katie Bowitski	70
Mrs. Henrietta Baer	70
" Rebecca E. Moore	70
" Mary A. Werrig	70
" A. E. Kornmann	70
" A. R. De Mangin	70
" M. Shellenslager	70
Miss Emily Keller	70

WHITE FEMALES—*Aged* 71 *Years.*

Miss Jane H. Edwards	71
Mrs. Rachel F. Hughes	71
" Elizabeth A. Wells	71
" Alersee Dresker	71
" Martha C. Webster	71
" Mary Welsh	71
" Mary A. Hamilton	71
" Johanna Regel	71
" Justina France	71
" Mary E. Gunther	71
" Louisa Itzinger	71
" Anna Wieskamp	71
" Sarah Kinneman	71
" Julia Keily	71
" Mina Rubert	71
" S. H. R. Nicholson	71
" Jane Rayner	71
" Mary Hoffman	71
" Katharine Cramblet	71
" Anne Pugh	71
Miss Margaret McCosker	71
" Caroline Ellender	71
Mrs. Mary A. Stansbury	71

WHITE FEMALES—*Aged* 72 *Years.*

Miss Mary Smith	72
Mrs. Sarah McAfee	72
" Fredericka Staub	72
" Fredericka Layer	72
" Isabella Flynn	72
" Margaret Appel	72
" Constance Schultz	72
" E. A. D. Harper	72
" Elizabeth Shum	72
" Sophie Tayman	72
" A. B. Greensfelder	72
" Catherine Gernest	72

TABLE No. 6—continued.

Mrs. H. B. S. Mathews	72
" Alice Sanderson	72
" Marg't Fitzpatrick	72
" Jane Benjamin	72
" Rose Rea	72
" M. A. Y. Penniman	72
" Fanny Frank	72
" Eva Lorentz	72

WHITE FEMALES—*Aged* 73 *Years.*

Miss Mary G. Farland	73
" Mary A. Stone	73
" Naomi E. Sellers	73
Mrs. Rachel Cohen	73
" Martha L. Berry	73
" Crisandrie Gough	73
" Jane C. Moore	73
" Sarah A. Sanders	73
" Mary W. Gibson	73
" Mary Smith	73
" Eliza A. Gordon	73
" Rachel Guyton	73
" Sophie Bainbridge	73
" Mary A. Smith	73
" Elizabeth Lentz	73
" Cath. Assberger	73
" Mary A. Leaverton	73
" Elizabeth Somers	73
" J. C. McConn	73
" C. H. Kriete	73
" Marie A. Watkins	73
" Gertrude Quenton	73
" Sophie Osborn	73

WHITE FEMALES—*Aged* 74 *Years.*

Mrs. Catharine Seyner	74
" Mary Dunlap	74
" M. Gluckstein	74
" Margaretha Mack	74
" Elizabeth A. Young	74
" Barbara Raps	74
" Matilda Maccubbin	74
" Julia A. Wiley	74
" Eliza Edmunds	74
" M. A. Monmonier	74
" Dorotha Goldsmith	74
Mrs. Sarah N. Busey	74
" Catharine Yaeger	74
" J. A. Montague	74
" Mary Schinning	74
" Elenora S. Rollins	74
" Jane Gondy	74
" Margaret J. Mettee	74
" E. Fleckenstein	74
" Elizabeth Snyder	74
" E. Cunningham	74
" Rachael G. Triplett	74
" Margaret Boehr	74

WHITE FEMALES—*Aged* 75 *Years.*

Miss Emily J. Smith	75
" Pauline Hall	75
" Margaret Barry	75
" Amanda E. Barnett	75
Mrs. Barbara Reis	75
" Mary A. Hackett	75
" Marg't Pamphilion	75
" Sarah A. Monroe	75
" Jane Burton	75
" Sarah A. Price	75
" Mary Curtis	75
" Elizabeth Neuman	75
" Ann Mulligan	75
" Margaret Dare	75
" Sarah C. Evans	75
" Elizabeth Bowers	75
" Charlotte Bobeat	75
" Catharine Smith	75
" Mary Gorman	75
" Josephine Kriger	75

WHITE FEMALES—*Aged* 76 *Years.*

Miss Susannah Zorn	76
" Teresa Winan	76
" Elizabeth Barnett	76
Mrs. Elizabeth Ross	76
" Sarah C. Wilmer	76
" Wilhelmina Gaul	76
" Ann E. Ashcroft	76
" Margaret Segert	76
" Martha Michael	76
" Cath. M. Eberlein	76

TABLE No. 6—continued.

Mrs.	Ellen O. Gorman	76
“	Sarah Lewyt	76
“	Martha A. Austen	76
“	Eva Pfortner	76
“	Rebecca Johnson	76
“	Mary E. Welden	76
“	Mary Umbridge	76
“	Ruth Childs	76
“	Kathrine Shockell	76
“	Eva Hammel	76
“	C. E. Richardson	76
“	Philipine Dietsch	76

WHITE FEMALES—*Aged* 77 *Years.*

Miss	Elizabeth A. Jessop	77
“	Ann M. Bauer	77
Mrs.	Margaret B. McKim	77
“	Ann M. Budsall	77
“	Ann M. Evans	77
“	Ann E. Duvall	77
“	R. A. Waggner	77
“	Susan Hooper	77
“	Mary C. Hadaway	77
“	Lucy A. Wamling	77
“	S. Bartholomaues	77
“	Bridget Dolan	77
“	Regina Haupt	77
“	A. M. Strohlein	77
“	Jane E. Miller	77
“	C. Bradenberger	77
“	Elmira S. Campbell	77
“	Eliza Baker	77
“	Annie Kelly	77
“	P. R. Bateman	77
“	Sarah Ware	77
“	Barbara Blum	77
“	C. G. Ohrenschall	77
“	Mary A. Child	77
“	Anne E. Seibel	77

WHITE FEMALES—*Aged* 78 *Years.*

Miss	Martha C. Seaver	78
“	Rachel Reddish	78
Mrs.	Eleanor Gayton	78
“	Barbara Ubell	78
“	Frances Livingston	78
Mrs.	Eleanor H. Debow	78
“	Veronica Kritzman	78
“	Sarah A. Arthur	78
“	Annie C. Allbaugh	78
“	Caroline Blum	78
“	Ann M. Miller	78
“	Casandra A. Coule	78
“	E. A. Kinghorn	78
“	Mary W. Moale	78
“	Mary E. Brown	78
“	Mary Albrecht	78
“	Sarah E Frozzell	78
“	Elizabeth Bennett	78
“	Elizabeth Baltz	78
“	Juliana Schubert	78
“	Rachael Ann Perry	78
“	Hannah Katz	78
“	Prudence Kendale	78
“	Elizabeth Brown	78
“	Ellen Stevens	78
“	Dorothea Yoe	78
“	Sophie Nittel	78

WHITE FEMALES—*Aged* 79 *Years.*

Miss	S. R. D. Haubert	79
Mrs.	Johanette Muth	79
“	Maud Morris	79
“	Marie Zingleng	79
“	Mary A. Watts	79
“	Margaret A. Smith	79
“	Annie C. Resch	79
“	Anna H. Wieman	79
“	Elizabeth A. Jones	79
“	Sarah C. White	79
“	Susan Maslin	79
“	Anna K. Muller	79
“	Henrietta Sperl	79
“	Esther Fox	79
“	Emily Perry	79
“	Mary Lynch	79

WHITE FEMALES—*Aged* 80 *Years.*

Miss	Eleanor Slaughter	80
“	Mary Riordon	80
Mrs.	Cath. Schneider	80
“	Emily McKinley	80

TABLE No. 6—continued.

Mrs. Eliza Holtzman	80
" Sarah A. Cannoles	80
" Amelia Levering	80
" Mary A. Cooper	80
" Sarah A. Marshall	80
" Annie M. Lebborz	80
" Elizabeth P. Tottle	80
" Sarah R. Baker	80
" Mary Quinn	80
" Cath. Reinmetz	80
" Ellen Casserley	80
" Elizabeth Drinkaus	80
" Judith B. Savage	80
" C. Heinzerling	80
" Mary Condlen	80
" Elizabeth Robinson	80
" E. Strobecker	80
" Jane M. Neely	80
" Mary Cramp	80
" Alice Kavanaugh	80

WHITE FEMALES—*Aged* 81 *Years.*

Miss Mary M. Davis	81
" Mattie L. Buckler	81
Mrs. Mina Weinman	81
" Mary Heimeyer	81
" W. Tuerke	81
" Wilhelmina Trunt	81
" Ann M. Saenger	81
" Anna M. Rose	81
" Sophia A. Ray	81
" Cath. Hergenheim	81
" Susan Maguire	81
" Mary Lighthunger	81
" Susan Davis	81
" Leah Smyser	81

WHITE FEMALES—*Aged* 82 *Years.*

Mrs. Susan Wolf	82
" Mary A. Hammond	82
" Josephine Johnson	82
" Eliza Garvish	82
" Rebecca A. Ward	82
" Isabella Barker	82
" Mary Temme	82
" Fredericka Schultz	82
Mrs. Margaret Hain	82
" Annie R. Litz	82
" M. Herschfeldt	82
" Susan Davis	82
" Margaret Wise	82
Miss Mary Doughaday	82
Mrs. Ann Crawford	82
" Elizabeth Kerr	82
" Katharine Kessler	82
" Esther F. Anderson	82
" Mary A. Hindes	82
" M. Simpson	82
" M. Glotzback	82
" Rebecca Truehart	82

WHITE FEMALES—*Aged* 83 *Years.*

Mrs. Ann M. Fischer	83
" Elizabeth Stewart	83
" Angeline Purnell	83
" Mary Berne	83
" Hannah Paterson	83
" Catharine Henry	83
" Minkle Hess	83
" A. K. M. Middendorf	83
" Mary Cokely	83
" Annie M. Poisal	83
" Elizabeth Rose	83
" Annie Garvey	83
" Sallie Smith	83
" Sarah C. Lewis	83
" Rosina Kercher	83
" Catharine Wallace	83
" Annie M. Hahn	83
" Margaret Cottrell	83
" Marie Kaiser	83
Miss Eliza Flood	83
" E. C. Nicholson	83
Sister Mary A. Connelly	83
Mrs. Susan Connelly	83
" Ann Waters	83
" Wilhelmina Becker	83

WHITE FEMALES—*Aged* 84 *Years.*

Miss Jane M. Andrews	84
Mrs. Susan Lawrence	84
" Annie Wilson	84

TABLE NO. 6—continued.

Mrs. Bridget Blake	84
" A. M. Lee	84
" Eliza Guyton	84
" Ellen McElroy	84
" Sarah M. Shelton	84
" Eliza Reeder	84
" Agnes King	84
" Sarah R. Pope	84
" Annie C. Adams	84
" Catherine Reiserer	84

WHITE FEMALES—*Aged* 85 *Years.*

Mrs. Bridget Stricker	85
" C. A. Timmermann	85
" M. P. Huppman	85
Miss Mary McNeal	85
" Frances A. Everist	85
Mrs. Martha Scanlon	85
" Catharine McCann	85
" Hannah Pendexter	85
" Julia J. Baugher	85
" Eliza S. McIntire	85
" Rachel Wolf	85
" Regina Koehler	85
" Susan McDonnell	85
" M. T. Osbourne	85
" Kathrine Horten	85
" Jane Furlong	85
" Marg't Thallaher	85
" Margaret Smiley	85
Miss Maria Crawford	85
Mrs. Sarah Ann Woods	85

WHITE FEMALES—*Aged* 86 *Years.*

Mrs. Cath. Tennison	86
" Sarah A. Bond	86
" Jemima Bishop	86
" Eliza Steigelman	86
" Deliah Day	86
" Rachel W. Lalley	86
" Ann Phillips	86
" R. Chamberlain	86
" Rachel Knox	86
" Martha Moore	86
" Caroline McCeney	86
" Edith B. Scott	86
Mrs. Annie E. Waters	86
" Hannah McKnew	86
" Honor France	86

WHITE FEMALES—*Aged* 87 *Years.*

Mrs. Keziah Fowler	87
" Margaret Murphy	87
" Sarah Fields	87
" Catharine Hauser	87

WHITE FEMALES—*Aged* 88 *Years.*

Miss Mary Mooney	88
Mrs. Ann Wynn	88
" Ann McLeary	88
" Johanna C. Sachs	88
" Catharine Barron	88
" Rebecca Boring	88
" Helen M. Wyville	88
" Eliza Loker	88
" Nancy B. Morgan	88

WHITE FEMALES—*Aged* 89 *Years.*

Mrs. Eliza Johnson	89
" Cath. Dillaway	89

WHITE FEMALES—*Aged* 90 *Years.*

Miss Catharine Struthoff	90
Mrs. Susan Ehrman	90
" Margaret Dulthorn	90
" Rachel Elliott	90
" Marie Ramo	90
" Susan O. Mayer	90

WHITE FEMALES—*Aged* 91 *Years.*

Mrs. Charlotte Reinhardt	91
" Fanny Harrington	91
" Charlotte Carnes	91
" Jane Bier	91

WHITE FEMALES—*Aged* 92 *Years.*

Miss Martha Griffith	92
Mrs. Mary Sampson	92
" Mary A. Bowers	92

WHITE FEMALES—*Aged* 93 *Years.*

Miss Eliza M. Friday	93
" Sarah Parker	93

TABLE No. 6—continued.

Mrs. Kathrine Youngman	93
“ Dora Gropp	93
“ Keziah Canby	93
“ Eleanore Carlile	93

WHITE FEMALES—*Aged* 94 *Years.*

Mrs. Margaret Kerns	94
“ Jane Bacon	94

WHITE FEMALES—*Aged* 95 *Years.*

Mrs. Margaret Terna	95

WHITE FEMALES—*Aged* 96 *Years.*

Mrs. Sarah McGee	96

WHITE FEMALES—*Aged* 97 *Years.*

Mrs. Julia Williams	97
“ Elizabeth Seeger	97

WHITE FEMALES—*Aged* 99 *Years.*

Mrs. Henrietta Harrigan	99

WHITE FEMALES—*Aged* 100 *Years.*

Mrs. Sarah Bessee	100

COLORED MALES—*Aged* 70 *Years.*

Mr. Joseph Heighe	70
“ Abram Harris	70
“ Allen Reed	70
“ Richard Johnson	70
“ Louis Scott	70
“ James Bagwell	70
“ Israel Bowen	70
“ John Hensen	70

COLORED MALES—*Aged* 72 *Years.*

Mr. James Blackiston	72
“ George W. Johnson	72
“ Zach. Richardson	72

COLORED MALES—*Aged* 74 *Years.*

Mr. Joseph Bryant	74
“ Alex. Brooks	74
“ John W. Johnson	74
“ Jacob Harris	74

COLORED MALES—*Aged* 75 *Years.*

Mr. Sam'l C. Williams	75
“ Perry Scott	75
“ Charles Stewart	75
“ John Miller	75

COLORED MALES—*Aged* 76 *Years.*

Mr. Thomas Jones	76
“ Henry Jones	76

COLORED MALES—*Aged* 78 *Years.*

Mr. James Anderson	78

COLORED MALES—*Aged* 80 *Years.*

Mr. Andrew Dockings	80
“ Adam Carter	80
“ L. Parker Bevan	80

COLORED MALES—*Aged* 81 *Years.*

Mr. Prince Jones	81
“ Washington Adams	81
“ Charles Nichols	81
“ Hazelton Thomas	81

COLORED MALES—*Aged* 82 *Years.*

Mr. George W. Tripp	82

COLORED MALES—*Aged* 83 *Years.*

Mr. Andrew Wisher	83

COLORED MALES—*Aged* 84 *Years.*

Mr. David Jones	84

COLORED MALES—*Aged* 85 *Years.*

Mr. Lloyd Phillips	85
“ Sam'l J. Kelly	85

COLORED MALES—*Aged* 89 *Years.*

Mr. Mark Morton	89

COLORED MALES—*Aged* 93 *Years.*

Mr. Edward Travers	93

COLORED MALES—*Aged* 97 *Years.*

Mr. Thomas Benson	97

COLORED MALES—*Aged* 102 *Years.*

Mr. W. Blackiston	102

Table No. 6—continued.

Colored Males—*Aged* 104 *Years.*

Mr. James Morris	104

Colored Females—*Aged* 70 *Years.*

Miss Rachel Jackson	70
Mrs. Mary Hazelton	70
" Mary A. Wilson	70
" Mary E. Hurbert	70
" Mary A. Wilson	70
" Rebecca Sanders	70
" Linda Shaford	70
" Rose Jackson	70

Colored Females—*Aged* 71 *Years.*

Miss Julia West	71
Mrs. Margaret Willmer	71

Colored Females—*Aged* 73 *Years.*

Mrs. Keziah Thomas	73

Colored Females—*Aged* 74 *Years.*

Mrs. Annie Jackson	74
" Rebecca Butler	74

Colored Females—*Aged* 75 *Years.*

Mrs. Lucy Richardson	75
" Martha Jackson	75
" Phœdie Jones	75
" Sophia Johnson	75
" Fannie Granby	75
" Mary Butler	75

Colored Females—*Aged* 76 *Years.*

Miss Matilda Prime	76
Mrs. Marie Morris	76

Colored Females—*Aged* 77 *Years.*

Mrs. Rosette Fisher	77
" F. A. Thompson	77
" Mary Johnson	77

Colored Females—*Aged* 78 *Years.*

Mrs. Elizabeth Dyke	78
" Charity Gilbert	78
" Elizabeth Haley	78
" Lilly Cooper	78

Colored Females—*Aged* 79 *Years.*

Miss Sarah A. Maxfield	79
Mrs. Charlotte A. White	79
" Martha Williams	79

Colored Females—*Aged* 80 *Years.*

Mrs. Rachel Williams,	80
" Nancy Woolford	80
" Dorcas Blake	80
" Agnes E. Magness	80
" Margaret Cook	80
" Mary Snowden	80
" Harriet Johnson	80
" Susan Barnes	80

Colored Females—*Aged* 81 *Years.*

Mrs. Sidney Butler	81

Colored Females—*Aged* 82 *Years.*

Miss Susan Gibson	82
Mrs. Emily Jackson	82
" Margaret Skinner	82

Colored Females—*Aged* 83 *Years.*

Mrs. Jane Folks	83

Colored Females—*Aged* 84 *Years.*

Mrs. Susan A. Shields	84
" Eustatia Hardy	84
" Phœbe Smith	84
" Emeline Hewitt	84

Colored Females—*Aged* 85 *Years.*

Miss Susan Boston	85
Mrs. Susan Scott	85
" Patsey Blue	85
" Priscilla Cornish	85
" Rebecca Mathews	85

Colored Females—*Aged* 86 *Years.*

Mrs. Jane Carter	86
" Ellen Simons	86

Colored Females—*Aged* 87 *Years.*

Mrs. Sallie Anthony	87
" Susan Pipes	87

TABLE NO. 6—continued.

COLORED FEMALES—*Aged* 88 *Years.*

Mrs. Milly Hamilton	88

COLORED FEMALES—*Aged* 89 *Years.*

Mrs. Martha A. Steward	89
“ Mary A. Johnson	89

COLORED FEMALES—*Aged* 90 *Years.*

Miss Anne James	90
Mrs. Rachel Saulsbury	90
“ Harriet Sprigs	90
“ Annie Smallwood	90
“ Mary Newton	90

COLORED FEMALES—*Aged* 93 *Years.*

Mrs. Cath. Freeman	93

COLORED FEMALES—*Aged* 100 *Years*

Mrs. Mary A. Jefferson	100

COLORED FEMALES—*Aged* 102 *Years*

Mrs. Lucy Johnson	102

COLORED FEMALES—*Aged* 104 *Years*

Mrs. Marie Harris	104
“ Susan Jackson	104

COLORED FEMALES—*Aged* 106 *Years*

Mrs. Jane Gent	106

COLORED FEMALES—*Aged* 110 *Years*

Mrs. Eliza Anderson	110

TABLE No. 6—concluded.

RECAPITULATION.

---

331 White males between 70 and 109 years. Total years, 25,666; averaging 76 years 6 months.
398 White females between 70 and 100 years. Total years, 31,460; averaging 78 years 10 months.
39 Colored males between 70 and 104 years. Total years, 3,070; averaging 78 years 7 months.
72 Colored females between 70 and 110 years. Total years, 5,897; averaging 81 years 10 months.
Total, 840 aged decedents, 66,093 years; averaging 78 years 8 months.

Table No. 7.

165. Mortality According to Age.

THE YEAR.

Age.	Native White.			Foreign White.			White.			Colored.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
Under 1 month....	286	208	499	....	....	....	286	208	494	112	83	195	398	291	689
1 to 11 months....	716	657	1373	7	9	16	723	666	1389	260	265	525	983	931	1914
1 to 4 years......	488	448	936	12	16	28	500	464	964	196	189	385	696	653	1349
5 to 9 "	93	83	176	7	8	15	100	91	191	35	40	75	135	131	266
10 to 14 "	44	39	83	5	4	9	49	43	92	15	23	38	64	66	130
15 to 19 "	68	74	142	10	6	16	78	80	158	27	41	68	105	121	226
20 to 24 "	117	107	224	21	28	49	138	135	273	36	42	78	174	177	351
25 to 34 "	207	241	448	53	40	93	263	282	545	76	91	167	339	373	712
35 to 44 "	189	145	334	103	75	178	299	221	520	101	83	184	400	304	704
45 to 54 "	143	125	268	138	120	258	288	246	534	73	75	148	361	321	682
55 to 64 "	107	112	219	174	150	324	284	263	547	35	44	79	319	307	626
65 to 74 "	127	145	272	183	161	344	314	309	623	41	51	92	355	360	715
75 to 84 "	79	113	192	99	118	217	179	232	411	20	42	62	199	274	473
85 and over.	16	52	68	21	23	44	37	75	112	10	27	37	47	102	149
All ages.......	2680	2549	5229	833	758	1591	3538	3315	6853	1037	1096	2133	4575	4411	8986

Note—There died during the year in the city of Baltimore 25 white males and 8 white females, whose birthplace was unknown. In the following tables, wherever a distinction is made as to nativity, such persons are not included, but are included under their proper heads in all other columns.

TABLE No. 7—continued.

JANUARY.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.			MALE.	FEMALE.	TOTAL.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.			
Under 1 month	15	18	33	....	...	....	15	18	33	11	6	17	26	24	50
1 to 11 months	44	29	73	....	1	1	44	30	74	23	16	39	67	46	113
1 to 4 years......	51	35	86	....	....	....	51	35	86	20	16	36	71	51	122
5 to 9 "	7	6	13	....	2	2	7	8	15	1	3	4	8	11	19
10 to 14 "	3	3	6	1	1	2	4	4	8	1	....	1	5	4	9
15 to 19 "	4	5	9	2	....	2	6	5	11	....	2	2	6	7	13
20 to 24 "	13	9	22	....	1	1	13	10	23	4	4	8	17	14	31
25 to 34 "	15	25	40	6	6	12	21	31	52	6	15	21	27	46	73
35 to 44 "	22	11	33	5	6	11	27	17	44	4	8	12	31	25	56
45 to 54 "	16	7	23	18	9	27	35	16	51	7	10	17	42	26	68
55 to 64 "	5	13	18	15	19	34	21	32	53	2	2	4	23	34	57
65 to 74 "	9	14	23	15	22	37	25	36	61	6	5	11	31	41	72
75 to 84 "	9	15	24	14	9	23	23	24	47	....	2	2	23	26	49
85 and over	3	3	6	2	1	3	5	4	9	....	4	4	5	8	13
All ages.......	216	193	409	78	77	155	297	270	567	85	93	178	382	363	745

TABLE NO. 7—continued.

FEBRUARY.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	MALE.	FEMALE.	TOTAL.
Under 1 month	17	18	35	....	....	....	17	18	35	3	4	7	20	22	42
1 to 11 months....	34	29	63	....	....	....	34	29	63	14	16	30	48	45	93
1 to 4 years......	45	39	84	2	2	4	47	41	88	23	26	49	70	67	137
5 to 9 "	11	10	21	1	1	2	12	11	23	6	2	8	18	13	31
10 to 14 "	2	4	6	....	....	....	2	4	6	....	....	....	2	4	6
15 to 19 "	3	5	8	1	1	2	4	6	10	2	4	6	6	10	16
20 to 24 "	10	13	23	....	2	2	10	15	25	2	5	7	12	20	32
25 to 34 "	20	22	42	1	3	4	21	25	46	6	5	11	27	30	57
35 to 44 "	23	14	37	11	5	16	34	19	53	12	9	21	46	28	74
45 to 54 "	14	6	20	9	10	19	23	16	39	5	5	10	28	21	49
55 to 64 "	18	8	26	16	16	32	34	24	58	2	3	5	36	27	63
65 to 74 "	7	22	29	8	17	25	15	39	54	4	8	12	19	47	66
75 to 84 "	6	13	19	7	14	21	13	27	40	2	3	5	15	30	45
85 and over........	2	8	10	....	1	1	2	9	11	....	1	1	2	10	12
All ages.......	212	211	423	56	72	128	268	283	551	81	91	172	349	374	723

TABLE NO. 7—continued.

MARCH.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.			MALE.	FEMALE.	TOTAL.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.			
Under 1 month	21	15	36	....	....	....	21	15	36	13	5	18	34	20	54
1 to 11 months....	54	37	91	1	....	1	55	37	92	31	24	55	86	61	147
1 to 4 years......	62	49	111	....	1	1	62	50	112	30	16	46	92	66	158
5 to 9 "	8	9	17	1	....	1	9	9	18	2	3	5	11	12	23
10 to 14 "	2	3	5	2	....	2	4	3	7	....	4	4	4	7	11
15 to 19 "	8	4	12	1	....	1	9	4	13	1	7	8	10	11	21
20 to 24 "	14	10	24	1	2	3	15	12	27	5	5	10	20	17	37
25 to 34 "	19	20	39	3	1	4	22	21	43	13	8	21	35	29	64
35 to 44 "	12	16	28	6	13	19	20	29	49	13	8	21	33	37	70
45 to 54 "	13	11	24	17	9	26	31	20	51	6	11	17	37	31	68
55 to 64 "	4	12	16	15	14	29	20	27	47	5	3	8	25	30	55
65 to 74 "	13	18	31	15	20	35	28	38	66	5	4	9	33	42	75
75 to 84 "	9	11	20	17	11	28	26	22	48	1	9	10	27	31	58
85 and over........	2	2	4	3	....	3	5	2	7	....	6	6	5	8	13
All ages.......	241	217	458	82	71	153	327	289	616	125	113	238	452	402	854

TABLE No. 7—continued.

APRIL.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	MALE.	FEMALE.	TOTAL.
Under 1 month	15	15	30	....	....	....	15	15	30	1	6	7	16	21	37
1 to 11 months....	33	25	58	....	....	....	33	25	58	11	12	23	44	37	81
1 to 4 years......	41	36	77	2	4	6	43	40	83	19	24	43	62	64	126
5 to 9 "	7	4	11	....	1	1	7	5	12	5	4	9	12	9	21
10 to 14 "	2	5	7	....	....	....	2	5	7	....	2	2	2	7	9
15 to 19 "	6	6	12	....	1	1	6	7	13	2	5	7	8	12	20
20 to 24 "	11	5	16	....	2	2	11	7	18	5	4	9	16	11	27
25 to 34 "	17	17	34	2	1	3	21	18	39	6	7	13	27	25	52
35 to 44 "	18	11	29	11	3	14	31	15	46	3	4	7	34	19	53
45 to 54 "	14	8	22	10	6	16	27	14	41	5	7	12	32	21	53
55 to 64 "	10	10	20	19	12	31	29	22	51	3	6	9	32	28	60
65 to 74 "	13	11	24	13	11	24	26	22	48	4	5	9	30	27	57
75 to 84 "	6	16	22	7	6	13	13	22	35	4	5	9	17	27	44
85 and over........	2	3	5	1	3	4	3	6	9	1	2	3	4	8	12
All ages.......	195	172	367	65	50	115	267	223	490	69	93	162	336	316	652

TABLE NO. 7—continued.

MAY.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.			MALE.	FEMALE.	TOTAL.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.			
Under 1 month	27	10	37	....	....	....	27	10	37	5	7	12	32	17	49
1 to 11 months....	35	19	54	1	3	4	36	22	58	20	10	30	56	32	88
1 to 4 years......	29	31	60	....	....	....	29	31	60	9	14	23	38	45	83
5 to 9 "	9	4	13	....	....	....	9	4	13	4	1	5	13	5	18
10 to 14 "	3	3	6	....	....	....	3	3	6	2	4	6	5	7	12
15 to 19 "	8	3	11	....	....	....	8	3	11	4	5	9	12	8	20
20 to 24 "	9	14	23	....	...	....	9	14	23	3	2	5	12	16	28
25 to 34 "	16	22	38	1	3	4	17	25	42	6	6	12	23	31	54
35 to 44 "	13	11	24	11	10	21	24	21	45	6	6	12	30	27	57
45 to 54 "	7	7	14	5	8	13	12	15	27	9	7	16	21	22	43
55 to 64 "	5	7	12	16	11	27	21	18	39	3	4	7	24	22	46
65 to 74 "	11	7	18	13	13	26	24	20	44	3	3	6	27	23	50
75 to 84 "	5	3	8	7	12	19	12	15	27	....	3	3	12	18	30
85 and over........	1	4	5	1	4	5	2	8	10	....	2	2	2	10	12
All ages.......	178	145	323	55	64	119	233	209	442	74	74	148	307	283	590

TABLE NO. 7—continued.

JUNE.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.			MALE.	FEMALE.	TOTAL.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.			
Under 1 month	28	20	48	....	....	....	28	20	48	7	6	13	35	26	61
1 to 11 months ...	84	103	187	1	1	2	85	104	189	32	37	69	117	141	258
1 to 4 years......	31	36	67	1	1	2	32	37	69	11	14	25	43	51	94
5 to 9 "	6	3	9	....	....	....	6	3	9	1	10	11	7	13	20
10 to 14 "	4	4	8	...	....	....	4	4	8	5	....	5	9	4	13
15 to 19 "	5	6	11	....	....	....	5	6	11	2	4	6	7	10	17
20 to 24 "	10	5	15	4	1	5	14	6	20	1	1	2	15	7	22
25 to 34 "	20	19	39	7	2	9	27	21	48	4	9	13	31	30	61
35 to 44 "	16	7	23	8	5	13	25	12	37	6	4	10	31	16	47
45 to 54 "	12	10	22	12	8	20	24	18	42	8	4	12	32	22	54
55 to 64 "	5	6	11	14	6	20	20	12	32	5	3	8	25	15	40
65 to 74 "	14	7	21	21	11	32	35	19	54	2	3	5	37	22	59
75 to 84 "	5	6	11	6	13	19	11	19	30	1	1	2	12	20	32
85 and over........	2	5	7	3	5	8	5	10	15	....	2	2	5	12	17
All ages.......	242	237	479	77	53	130	321	291	612	85	98	183	406	389	795

TABLE NO. 7—continued.

JULY.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.			MALE.	FEMALE.	TOTAL.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.			
Under 1 month....	37	26	63	....	....	....	37	26	63	19	6	25	56	32	88
1 to 11 months....	166	146	312	....	4	4	166	150	316	40	51	91	206	201	407
1 to 4 years......	49	39	88	2	2	4	51	41	92	16	29	45	67	70	137
5 to 9 "	7	10	17	1	2	3	8	12	20	5	4	9	13	16	29
10 to 14 "	7	3	10	....	....	....	7	3	10	2	3	5	9	6	15
15 to 19 "	4	9	13	3	....	3	7	9	16	3	...	3	10	9	19
20 to 24 "	4	11	15	1	7	8	5	18	23	4	3	7	9	21	30
25 to 34 "	14	26	40	11	2	13	25	28	53	6	9	15	31	37	68
35 to 44 "	12	12	24	8	3	11	20	15	35	9	7	16	29	22	51
45 to 54 "	10	8	18	7	14	21	18	22	40	5	5	10	23	27	50
55 to 64 "	15	9	24	15	16	31	30	25	55	2	1	3	32	26	58
65 to 74 "	13	7	20	15	11	26	28	18	46	6	5	11	34	23	57
75 to 84 "	7	11	18	8	7	15	15	18	33	5	3	8	20	21	41
85 and over.... ..	1	4	5	3	3	6	4	7	11	....	2	2	4	9	13
All ages.......	346	321	667	74	71	145	421	392	813	122	128	250	543	520	1063

TABLE No. 7—continued.

AUGUST.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	MALE.	FEMALE.	TOTAL.
Under 1 month....	43	37	80	....	....	....	43	37	80	8	9	17	51	46	97
1 to 11 months....	94	101	195	....	....	....	94	101	195	29	31	60	123	132	255
1 to 4 years......	59	57	116	4	1	5	63	58	121	20	11	31	83	69	152
5 to 9 "	10	2	12	1	....	1	11	2	13	3	3	6	14	5	19
10 to 14 "	6	3	9	1	1	2	7	4	11	4	4	8	11	8	19
15 to 19 "	4	12	16	1	....	1	5	12	17	2	4	6	7	16	23
20 to 24 "	13	6	19	4	4	8	17	10	27	3	5	8	20	15	35
25 to 34 "	11	21	32	5	11	16	16	32	48	5	11	16	21	43	64
35 to 44 "	15	17	32	12	7	19	27	24	51	12	4	16	39	28	67
45 to 54 "	6	15	21	11	9	20	17	24	41	5	6	11	22	30	52
55 to 64 "	7	15	22	22	11	33	29	26	55	2	4	6	31	30	61
65 to 74 "	12	10	22	18	7	25	31	17	48	4	2	6	35	19	54
75 to 84 "	6	10	16	9	9	18	15	19	34	....	5	5	15	24	39
85 and over........	2	3	5	1	....	1	3	3	6	1	2	3	4	5	9
All ages.......	288	309	597	89	60	149	378	369	747	98	101	199	476	470	946

TABLE NO. 7—continued.

SEPTEMBER.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	MALE.	FEMALE.	TOTAL.
Under 1 month	23	12	35	....	....	....	23	12	35	17	7	24	40	19	59
1 to 11 months....	63	72	135	4	....	4	67	72	139	20	16	36	87	88	175
1 to 4 years......	28	33	61	....	1	1	28	34	62	11	9	20	39	43	82
5 to 9 "	5	7	12	....	....	....	5	7	12	1	....	1	6	7	13
10 to 14 "	5	2	7	....	1	1	5	3	8	....	4	4	5	7	12
15 to 19 "	3	11	14	1	4	5	4	15	19	1	1	2	5	16	21
20 to 24 "	7	4	11	3	2	5	10	6	16	....	2	2	10	8	18
25 to 34 "	13	13	26	2	1	3	15	14	29	13	7	20	28	21	49
35 to 44 "	16	12	28	7	4	11	24	16	40	7	7	14	31	23	54
45 to 54 "	14	14	28	16	7	23	30	21	51	4	5	9	34	26	60
55 to 64 "	9	6	15	13	12	25	22	18	40	....	1	1	22	19	41
65 to 74 "	10	10	20	10	11	21	20	21	41	1	4	5	21	25	46
75 to 84 "	3	7	10	5	11	16	8	18	26	2	5	7	10	23	33
85 and over........	....	1	1	2	3	5	2	4	6	3	1	4	5	5	10
All ages.......	199	204	403	63	57	120	263	261	524	80	69	149	343	330	673

TABLE NO. 7—continued.

OCTOBER.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	MALE.	FEMALE.	TOTAL.
Under 1 month....	21	13	34	....	....	....	21	13	34	7	12	19	28	25	53
1 to 11 months....	34	40	74	....	....	....	34	40	74	11	16	27	45	56	101
1 to 4 years......	42	34	76	1	2	3	43	36	79	17	9	26	60	45	105
5 to 9 "	9	10	19	....	1	1	9	11	20	3	3	6	12	14	26
10 to 14 "	4	2	6	....	....	....	4	2	6	....	2	2	4	4	8
15 to 19 "	6	5	11	1	...	1	7	5	12	1	1	2	8	6	14
20 to 24 "	5	14	19	3	4	7	8	18	26	2	5	7	10	23	33
25 to 34 "	22	22	44	3	5	8	25	27	52	3	6	9	28	33	61
35 to 44 "	13	9	22	8	5	13	22	14	36	16	10	26	38	24	62
45 to 54 "	10	7	17	11	19	30	21	26	47	2	4	6	23	30	53
55 to 64 "	12	9	21	13	6	19	25	16	41	5	3	8	30	19	49
65 to 74 "	6	18	24	17	14	31	23	32	55	2	5	7	25	37	62
75 to 84 "	6	6	12	6	8	14	13	14	27	3	3	6	16	17	33
85 and over........	....	8	8	1	1	2	1	9	10	2	3	5	3	12	15
All ages.......	190	197	387	64	65	129	256	263	519	74	82	156	330	345	675

TABLE No. 7—continued.

NOVEMBER.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.			MALE.	FEMALE.	TOTAL.
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.			
Under 1 month.....	17	9	26	....	....	....	17	9	26	7	6	13	24	15	39
1 to 11 months....	36	21	47	....	....	...	36	21	57	12	14	26	48	35	83
1 to 4 years......	24	34	59	....	2	2	25	33	61	11	10	21	36	46	82
5 to 9 "	7	7	14	....	1	1	7	8	15	2	4	6	9	12	21
10 to 14 "	3	5	8	1	....	1	4	5	9	1	....	1	5	5	10
15 to 19 "	6	4	10	....	....	....	6	4	10	3	6	9	9	10	19
20 to 24 "	10	8	18	3	1	4	13	9	22	4	4	8	17	13	30
25 to 34 "	19	14	33	5	1	6	25	16	41	3	5	8	28	21	49
35 to 44 "	12	13	25	10	8	18	22	21	43	3	8	11	25	29	54
45 to 54 "	14	12	26	9	14	23	23	26	49	9	4	13	32	30	62
55 to 64 "	10	5	15	5	15	20	15	20	35	4	7	11	19	27	46
65 to 74 "	11	8	19	13	8	21	26	18	44	3	4	7	29	22	51
75 to 84 "	10	5	15	6	9	15	16	15	31	2	2	4	18	17	35
85 and over........	....	4	4	2	....	2	2	4	6	2	1	3	4	5	9
All ages.......	180	149	329	54	59	113	237	212	449	66	75	141	303	287	590

TABLE NO. 7—concluded.

DECEMBER.

AGE.	NATIVE WHITE.			FOREIGN WHITE.			WHITE.			COLORED.					
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	MALE.	FEMALE.	TOTAL.
Under 1 month	22	15	37	....	....	....	22	15	37	14	9	23	36	24	60
1 to 11 months....	39	35	74	....	....	....	39	35	74	17	22	39	56	57	113
1 to 4 years......	26	25	51	....	....	....	26	25	51	9	11	20	35	36	71
5 to 9 "	7	11	18	3	....	3	10	11	21	2	3	5	12	14	26
10 to 14 "	3	2	5	....	1	1	3	3	6	....	....	....	3	3	6
15 to 19 "	11	4	15	....	....	....	11	4	15	6	2	8	17	6	23
20 to 24 "	11	8	19	2	2	4	13	10	23	3	2	5	16	12	28
25 to 34 "	21	20	41	7	4	11	28	24	25	5	3	8	33	27	60
35 to 44 "	17	12	29	6	6	12	23	18	41	10	8	18	33	26	59
45 to 54 "	13	20	33	13	7	20	27	27	54	8	7	15	35	34	69
55 to 64 "	7	12	19	11	12	23	18	24	42	2	7	9	20	31	51
65 to 74 "	8	13	21	25	16	41	33	29	62	1	3	4	34	32	66
75 to 84 "	7	10	17	7	9	16	14	19	33	....	1	1	14	20	34
85 and over........	1	7	8	2	2	4	3	9	12	1	1	2	4	10	14
All ages.......	193	194	387	76	59	135	270	253	523	78	79	157	348	332	680

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